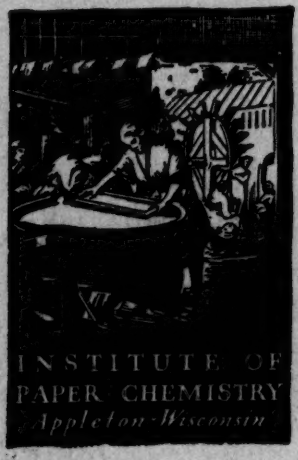
PAGES 307-384

BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH
LAWRENCE COLLEGE
APPLETON, WISCONSIN

LIBRARY NOTES

JANUARY • 1953
Volume 23 Number 5

THE cut on the cover is a reproduction of the Bookplate of The Institute of Paper Chemistry. The drawing, entitled, "the Papermaker," first appeared in 1698 in the Book of Trade by Christoff Weigel. This particular reproduction has been copied from an illustration appearing on page 43 of Dard Hunter's book "Papermaking Through Eighteen Centuries," published in New York in 1930 by William Edwin Rudge. THE INSTITUTE is greatly indebted to Mr. Hunter for permission to use the illustration.

AUTHOR INDEX TO BOOKS

American Petroleum Institute 307
Anthony, R. N. 308
Bonner, J. T. 307
Day, J. S. 308
Gysel, H. 307
Inberdis, J. 307
Kerr, P. F. 307
Kimball, G. E. 308
Laughton, E., tr. 307
Mathews, R. W. 307
Morse, P. M. 308
Philadelphia Quartz Company 308
Preston, R. D. 307
Roselius, L. W., ed. 307
S&S Corrugated Paper Machinery Co., Inc. 307
Sandell, E. B. 307
Stephenson, J. N., ed. 308
Ullman, M. B. 308
U. S. Bureau of the Census 308
University of California 307
Vail, J. G. 308
Voet, A. 308
Walls, G. L. 307
Werner, A. W. 307
Wills, J. H. 308

AUTHOR INDEX TO ABSTRACTS

The letter P preceding a page number indicates a patent abstract.

A B C Corrugated Box Company ...P 368
Adams, N. W. 365
A B Svensk Fläktfabriken .....P 367
Albrecht, J. 354
Allen, L. N., Jr. .....P 374
Allis-Chalmers Manufacturing Company .....P 366
Almin, K. E. 317
Amberg, H. R. 358, 364
American Cyanamid Company ....P 375, P 381
American Reenforced Paper Company P 372
American Society for Testing Materials. *Committee D-6 on Paper and Paper Products. Subcommittee I on Paper Testing Methods* 348
Amidon, G. 328
Andersen, E. .....P 376
Anderson, A. B. 364
Andrews, E. D. 363
Annett, S. R. P. 359
Anthes, J. A. .....P 381
Aries, R. S. 360
Arthur, C. J. .....P 375
Associated Brands, Inc. 344
The Babcock & Wilcox Company ...P 380
Bagnall, J. .....P 371
Baker, E. D. S. 339
Baker, M. W. .....P 367
Ball, F. J. .....P 370
Ballantine, P., & Sons .....P 372
Banks, W. H. 351
Bargilliat, A. 354
Barkey, K. T. 317
Beil, F. F. .....P 367
Beloit Iron Works .....P 374
Bemis Bros. Bag Company ..P 374, P 376
Berg, E. 325
Bergstein, R. M. .....P 369
Beyer, D. L. 362
Bigler, O. A. 353
Billeruds Aktiebolag .....P 379
Birdsall, H. A. 325
Blais, M. 354
Bland, D. E. 332
Boehm, R. M. 312
Bonutto, A. L. 313
Bridges, R. R. 321
Briggs Manufacturing Company ....P 367
British Commonwealth Forestry Conference 328
Brown, A. W. .....P 370
Brown, R. E. .....P 377
Bunn, B. H., Co. 335
Busch, A. W. 311
Buttery, K. T. .....P 369
Canada Paper Company .....P 371
Canadian Chemical Processing 362
Cannard, W. H. .....P 372
Carlsson, G. E. 349, 351, 354
Carroll, M. 361
Carson, F. T. 348
Carter, R. 336
Casten, R. 322
Celanese Corporation of America ...P 368
Century Engineering Co. .....P 376
Charles, G. K. .....P 373
Chase, A. J. 335
Chemical Construction Corporation .P 374
Christoph, K. 313
Clabe, J. 345
Clulow, F. W. 352
Coghill, J. T. .....P 372
Container Corporation of America ..P 368
Corn Products Refining Company ...P 379
Corson Manufacturing Company ...P 370
Coupe, R. R. 347, 349, 352
Craig, M. E. .....P 379
Cramer, G. 346
Crown Zellerbach Corporation .....P 379
Cupo, W. J. 327
Curlator Corporation .....P 372
Curtis, C. F., II .....P 367
Curtis Companies, Incorporated ....P 367
Cusack, W. T. 345
Dangon, G. 345
Danielson, A. C. .....P 368
Dart, L. S. 326
Daul, G. C. 325
Deck, P. .....P 372
Deleon, M. 342
Denny, J. L. 327
Deutscher Normenausschuss. *Fachnormenausschuss Kunststoffe* 325
Diamond Alkali Company .....P 370
Dick, G. M. .....P 366
Dimick, R. E. 358
Downing, J. .....P 368
Drewitt, J. G. N. .....P 368
Dudley, J. R. .....P 381
Durst, R. E. 335
Dyck, A. W. J. 342
Eastman Kodak Company .....P 380
Eaton, K. J. 337
Eberhardt, L. 310
Ecusta Paper Corporation .....P 377
Edling, G. 328
Eklund, R. 311
Ekman, S. U. .....P 368
Electrolux Corporation .....P 376
Elfving, L. 318, 326
Elliott, N. J. 324
Emerton, H. W. 315
Engeler 331
Esselte forpackning ab .....P 372
Essex, G. H. 347
Evans, J. C. W. 343
Faichney, L. M. 348
Fair, E. W. 338
Farber, E. 319
Fehrlin, A. 331
Felicetta, V. F. 329
Ferrier, J. A. 337
Fibre Containers 312
First, M. W. 334
Fletcher, T. L. 332
Food Engineering 339

Forrest, F. R. 336
Fowler, R. M. 342
Frank, R. H. 361
Frankenstein, W. P. ..... P 378
Freeman, S. E. ..... P 380
Gaubert, R. J. ..... P 373
Gaylord Container Corporation ..... P 378
George, W. C. ..... P 378
Gibbons, C. F. ..... P 378
Giddings, E. L. 328
Gilbert, J. A. ..... P 373
Goetz, F. W. 350
Goodwillie, J. E. ..... P 374
Gould-National Batteries, Inc. 358
Gow, J. T. 324
Gressang, R. W. ..... P 370
Grimmett, R. E. R. 360
Gripenberg, J. 364
Guaranty Investment Corporation, Limited ..... P 380
Hader, R. N. 319
Hagopian, V. ..... P 378
Hall, C. D. 350
Hall, E. K. ..... P 374
Hall, J. A. 354
Han, S. T. 309
Hanlon, W. D. 359
Harris, E. E. 332
Harris, W. R. ..... P 369
Hart, A. C. 365
Hartler, N. 315
Harwood, V. D. 316
Hawthorn-Mellody Farms Dairy ... 339
Haydu, E. P. 358
Hayes, R. D. ..... P 376
Hayhurst, L. J. 340
Hercules Powder Company ..... P 381
Herdle, L. E. 319
Heritage, C. C. ..... P 370
Hermans, J. J. 320
Hersey, R. M. ..... P 376
Hersh, S. P. 361
Hillis, W. E. 332
Hirsch, P. 316, 317
Hitchcock, G. C. ..... P 375
Hoak, R. D. 358
Hoeppner, A. D. ..... P 376
Holgersson, S. P. H. E. ..... P 369
Hollick, S. H. 340
Hubert, E. E. 323
Hunter, R. S. 348
Ingersoll-Rand Company ..... P 366
Ingve, B. G. V. ..... P 367
Inskeep, G. C. 314
International Gift Box Company ... 309
Jacobs, F. M. 314
Jacobsen, R. 312
Jenness, L. C. 335
Jensen, M. L. ..... P 366
Johansson, A. 322
Johnsson, J. ..... P 379
Karassik, I. J. 336
Karlsson, K. A. ..... P 371
Katzen, R. ..... P 370
Keeney, F. C. 353
Keilen, J. J., Jr. ..... P 370
Keim, G. I. ..... P 381
Kelsey, W. ..... P 373
Kerr, R. W. ..... P 379
Keswick, R. J. P. 355
Keyser, L. S. ..... P 377
King, C. F. 352
Koenig, F. 362
Kohlitz, W. 353
Koonce, S. ..... P 380
Kotte, H. 345, 358
Kündig, S. 354
Landes, C. G. ..... P 375
Langro, G. 374
Laqueur, V. 343
Lawton, E. J. 318
Lee, F. T. ..... P 374
Lefferts, E. B. 317
Legendre, K. A. 357
Leighton, G. J. 350
Leopold, B. 332
Levess & Elliott. Methods Department 338
Levy, R. M. ..... P 377
Lientz, J. R. 324
Lillie, E. F. ..... P 368
Lindgren, B. O. 333
Lindsay, W. ..... P 371
Logan, D. V. 329
Lolkema, J. ..... P 376, P 379
Lyijynen, F. ..... P 367
McCarthy, J. L. 329
MacDonald, C. R. ..... P 377
McDonough, L. J. ..... P 370
McGill, J. S. 340
McIntyre, A. C. 323
Macklem, W. W. 336
McMillan, J. H. 345
Makarius, T. 309
Malm, C. J. 317
Mason, S. G. 348, 361
The Mason Box Company ..... P 372
Matagrin, A. 331
Mattisson, M. F. 357
May, D. C. 317
The Mead Corporation ..... P 369
Messing, H. S. ..... P 366
Meyer, K. H. 358
Micheel, F. 323
Millett, M. A. 318
Minnesota Mining and Manufacturing Company ..... P 377
Mo och Domsjö Aktiebolag ..... P 368
Moller, F. A. ..... P 376
Monroy, J. H. 347
Montgomery, D. J. 361
Mottet, A. L. 313
Murdock, H. R. 359, 362
Murray, J. A. 330
Naamlooze Vennootschap: W. A. Scholtens Chemische Fabrieken .. .. P 376, P 379
Nashua Corporation ..... P 373
Nemoede, P. A. ..... P 368
Neubrech, W. L. 341
Nitsche, R. 351
Ohl, F. 363
Olyphant, M., Jr. 326
Owens-Corning Fiberglas Corporation P 370
Packaging Parade 340
Pals, D. T. F. 320
Paper Sales 346
Papirindustriens Forskningsinstitutt. P 371
The Patent and Licensing Corporation ..... P 377
Patton, E. A. ..... P 367
Payne, A. W. 356
Pearl, I. A. ..... 362, P 381
Peniston, Q. P. 329
Perry, E. ..... P 380
Perry, L. M. ..... P 373
Peterson, L. E. 326
Petz, A. 312
Pihl, L. 347, 349, 351
Pittsburgh Plate Glass Company ... P 380
The Plastic Barrel Corporation ..... P 378
Pole, G. R. ..... P 377
Pollak, A. 360
Pouliot, L. J. 341
Powell, G. ..... P 375
Printing, Packaging and Allied Trades Research Association 354
Prout, J. 333
Pulp & Paper 343
Rayonier Incorporated ..... P 377
Reid, J. D. 325

Reinhardt, R. M. 325
Rhinelander Paper Company 360
Richardson, H. L. 346
Richter, G. A. 319
Riddell, G. L. 320, 341, 354
Rioux, L. 329
Ritson, D. D. .....P 375
Rocereta, W. J. .....P 375
Rodvil, Société Anonyme 333
Rogers, B. B. 333
Rohdin, J. O. .....P 372
Rose, A. G. .....P 373
Rose, S. E. 337
Rose Brothers (Gainsborough) ..... Limited .....P 373
Rosenthal, A. J. 321
Rudberg, M. S. .....P 369
Rudolfs, W. 359, 364
Ruff, H. T. .....P 369
Rumpf, A. N. 327
Rydberg, D. R. .....P 369
S&S Corrugated Paper Machinery Co., Inc. .....P 371, P 373
Saedén, U. 333
Saeman, J. F. 318
Samuelson, O. 315
Sandermann, W. 322
Sauter, C. A., Company, Inc. 356
Sawyer, C. N. 311
Schärfe, E. 322
Schoening, M. A. 310
Schriek, D. 314
Schumann, H. F. .....P 377
Schur, M. O. 377
Scoville, D. M. .....P 375
Scruggs, T. M. .....P 374
Seidel, R. J. 350
Seubert, R. F. 363
Sève, R. 321
Shapiro, D. H. .....P 370
Shaw, E. C. .....P 366
Shields, A. F. .....P 371, P 373
Sihtola, H. 355
Sikorski, J. 315
Silverman, L. 334
Simplex Packaging Machinery, Inc. P 373
Smith, A. H. 349
Smith, F. W. 319
Sonni, O. 311
Standard Paper Box Limited .....P 370
Stefanich, A. J. .....P 378
Stel, M. 314
Stephansen, E. .....P 371
Stevenson, A. B. .....P 372
Stevenson, J. F., Jr. .....P 369
Stobo, W. E. 359
Storviks Sulfit Aktiebolag .....P 369
Sulphite Products Corporation ....P 381
Sutherland Paper Company .....P 369
Technical Association of the Pulp and Paper Industry 322, 350
Technical Association of the Pulp and Paper Industry. *Paper Making (Cylinder) Committee* 333
Thomas, R. K. 347
The Timken Roller Bearing Company P 379
Tobias, L. S. 346
Tollenaar, D. 321
Tomlinson, G. H., II. 336
Travis, E. 350
Tuck, N. G. M. 336
Tucker, M. J. 337
Tutt, R., Jr. 341
Twardowicz, A. H. 313
Udy, M. J. .....P 380
U. S. Department of Commerce. *National Production Authority* 357
United States Rubber Company .....P 368
Valeur, C. 364
van de Kamp, F.-P. 323
van der Meer, J. H. 354
van der Meer, W. A. .....P 379
Van Horn, P. 314
Vaultier, R. 330
Wagenhals, R. E. .....P 379
Wahl, E. A. .....P 372
Wahtera, W. E. 319
Waldeck, W. F. 319
Walter, L. 309
Ware, G. 314
Weesner, R. J. 334
Wellbrock, R. 335
West, C. J. 346
West Virginia Pulp and Paper Company .....P 371
Wetherell, R. A. .....P 372
Weyl, P. 334
White, B. B. 321
Whitney, R. P. 309
Wilcox, D. B. 337
Wilcox, M. G. .....P 368
Wilcoxson, L. S. .....P 380
Williams, E. J. 332
Winfield, J. L. 339
Winkler, H. 330
Winters, R. J. .....P 372
Woebcken, W. 326
Wood Conversion Company .....P 370
Woods, H. J. 315
Workman, B. B. .....P 375
Worthington, V. 348
Wright, E. E. 351
Wright, R. H. 310
Wright, W. D. 323
Wrist, P. E. 315
Zuckerman, R. 352

BOOK REVIEWS

Jahn, E. C., ed. 382
Voet, A. 382
Wise, L. E., ed. 382

BULLETIN

of

THE INSTITUTE of PAPER CHEMISTRY

AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

JANUARY • 1953

Volume 23 Number 5

LIBRARY NOTES

The Bulletin of The Institute of Paper Chemistry is published monthly at Appleton, Wisconsin, by the Board of Trustees of The Institute of Paper Chemistry. Entered as Second Class matter November 13, 1930, at the postoffice at Appleton, Wis., under the act of August 24, 1912. Printed in U.S.A.

THE INSTITUTE OF PAPER CHEMISTRY

OFFICERS

ERNST MAHLER	Chairman of the Board
D. C. EVEREST	Vice-Chairman of the Board
JOHN L. RIEGEL	Vice-Chairman of the Board
WESTBROOK STEELE	President
JOHN G. STRANGE	Vice-President—Treasurer
C. B. SITTERSON, JR.	Secretary
DORIS PICKERT	Assistant Secretary

BOARD OF TRUSTEES

NATHAN M. PUSEY, President of Lawrence College, ex officio
WESTBROOK STEELE, President of The Institute of Paper Chemistry, ex officio

For the term expiring in 1953

DAN K. BROWN, Neenah Paper Company, Neenah, Wis.
GEORGE E. DYKE, Robert Gair Company, New York, N.Y.
STUART E. KAY, International Paper Company, New York, N.Y.
A. B. LAYTON, Crown Zellerbach Corporation, San Francisco, Calif.
KARL E. STANSBURY, Thilmany Pulp and Paper Company, Kaukauna, Wis.

For the term expiring in 1954

SYDNEY FERGUSON, The Mead Corporation, Dayton, Ohio.
DONALD S. LESLIE, Hammermill Paper Company, Erie, Pa.
ERNST MAHLER, Kimberly-Clark Corporation, Neenah, Wis.
W. IRVING OSBORNE, JR., Cornell Paperboard Products Company, Chicago, Ill.

For the term expiring in 1955

D. C. EVEREST, Marathon Corporation, Rothschild, Wis.
DAVID L. LUKE, JR., West Virginia Pulp and Paper Company, New York, N.Y.
GEORGE OLMSTED, JR., S. D. Warren Company, Boston, Mass.
HERBERT T. RANDALL, The Champion Paper and Fibre Company, Hamilton, Ohio.
JOHN L. RIEGEL, Riegel Paper Corporation, New York, N.Y.

STANDING COMMITTEES OF THE TRUSTEES

EXECUTIVE COMMITTEE: Ernst Mahler, Chairman; D. K. Brown, George E. Dyke, David L. Luke, Jr., and Karl E. Stansbury.
INVESTMENT COMMITTEE: Ernst Mahler, Chairman; D. K. Brown, John G. Strange, and Ralph J. Watts.
COMMITTEE ON ACADEMIC POLICY: Nathan M. Pusey, Chairman; Rex Hovey, Harry F. Lewis, Ernst Mahler, John L. Riegel, Westbrook Steele, and John G. Strange.

Books and Pamphlets Added to the Library During December

BIOLOGY

BONNER, JOHN TYLER. Morphogenesis, an essay on development. Princeton, N.J., Princeton University Press, 1952. 296 p.

BOARD, CORRUGATED

ROSELIUS, LOUIS W., ed. Corrugated fibre box manufacturers' handbook. 1st ed. Technical contents by A. W. Werner. Brooklyn, S & S Corrugated Paper Machinery Co., Inc. [c1952] 262 p.

CHEMISTRY—TABLES

GYSEL, H. Tables of percentage compositions of organic compounds. Basel, Verlag Birkhauser, 1951. 637 p.

CHEMISTRY, ANALYTIC—QUANTITATIVE

SANDELL, E. B. Colorimetric determination of traces of metals. 2d ed., rev. and enl. New York, Interscience Publishers, 1950. 673 p.

CLAY

AMERICAN PETROLEUM INSTITUTE. Reference clay minerals. American Petroleum research project 49. Preliminary reports, no. 1-8 [by P. F. Kerr and others] New York, Columbia University, 1951. Various pagings.

COLOR-BLINDNESS

WALLS, GORDON L., and MATHEWS, RAVENNA W. New means of studying color blindness and normal foveal color vision, with some results and their genetical implications. University of California publications in psychology, vol. 7, no. 1. Berkeley and Los Angeles, University of California Press, 1952. 172 p.

FIBER—STRUCTURE

PRESTON, R. D. The molecular architecture of plant cell walls. [New York] Wiley [1952] 211 p.

HISTORY

IMBERDIS, JEAN. Papyrus or the craft of paper. Translated by Eric Laughton. Hilversum, Holland, The Paper Publications Society, 1952. 69 p.

PRINTING

VOET, ANDRIES. Ink and paper in the printing process. New York, Interscience Publishers, 1952. 213 p.

RESEARCH

ANTHONY, ROBERT N., and DAY, JOHN S. Management controls in industrial research organizations. Boston, Division of Research, Graduate School of Business Administration, Harvard University, 1952. 537 p.

MORSE, PHILIP M., and KIMBALL, GEORGE E. Methods of operations research. 1st ed. rev. New York, Wiley [1951] 158 p.

SILICA AND SILICATES

VAIL, JAMES G. Soluble silicates, their properties and uses. Assisted by John H. Wills and the staff of Philadelphia Quartz Company. New York, Reinhold, 1952. v. 2: Technology. 669 p.

STATISTICS

U. S. BUREAU OF THE CENSUS. Statistical abstract of the United States, 1952. 73d ed. Prepared under the direction of Morris B. Ullman. Washington, U. S. Govt. Print. Off., 1952. 1081 p.

TRADE CATALOGS

NATIONAL DIRECTORY of the Canadian pulp and paper industries, 1952. J. N. Stephenson, editor. Gardenvale, Que., National Business Publications Limited, 1952. 473 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ACID PLANT

WHITNEY, ROY P., and HAN, S. T. Design basis for ammonia-base sulphite raw-acid towers. Tappi 35, no. 12: 569-76 (December, 1952).

Current interest in the ammonia-base sulfite process has directed attention to the preparation of the raw cooking acid. Since the ammonia-base system has certain unique features with respect to the other bases, the acid-making equipment must be designed and must function accordingly. The factors which are important in the design of a raw-acid tower are considered in some detail, and an accumulation of the best available design data for this system is presented. These data are derived in part from the literature and in part from previously unpublished work. The data and techniques presented are then used in an illustrative problem involving a raw-acid tower design for a set of typical operating conditions. The conversion of existing equipment to ammonia-base operation is also considered. 6 tables, 7 figures, and 15 references. E.S.

ADVERTISING

INTERNATIONAL GIFT BOX COMPANY, *Newark, N.J.* Color booklet gets mail orders from retailers. Boxboard Containers 70, no. 720: 38-9 (December, 1952).

This company is employing an eight-page, mail order "salesman," a booklet which shows a three-dimensional box that changes color with a flip of the sample papers behind it. In this way customers can review the entire line of the company. A simple order blank and a prepaid envelope are enclosed to make ordering easy. 3 illustrations. L.C.

AIR CONDITIONING

MAKARIUS, THEODORE. Air conditioning in the pressroom. Modern Lithography 20, no. 12: 49, 103 (December, 1952).

Proper air conditioning in the pressroom eliminates static and the bulging and curling of paper sheets and maintains a uniformity of moisture on the plate, thereby lessening ink-drying problems. Conditioners must be able to adapt quickly to changes in humidity caused by the removal or bringing-in of large quantities of paper; if they cannot, large inventories of paper should be changed only when the presses are shut down. Other suggestions for maintaining proper relative humidity (50%) are given. L.C.

WALTER, LEO. Air conditioning in the printing and paper industry. Paper Making and Paper Selling 71, no. 3: 21-7 (Autumn, 1952).

Air treatment which creates the conditions of temperature and co-ordinated humidity required for the various printing processes and of comfort to the plant operators is discussed. Central and unit air-conditioning systems are described and the automatic and wet-and-dry-bulb methods of control are

defined. Examples of several conditioner layouts for plants of various design and requirements are given. 13 figures. L.C.

ALKALINE PROCESSES—ODOR TROUBLE

SCHOENING, M. A., and WRIGHT, R. H. Intensity of the odor release at various points in the kraft pulping process. Tappi 35, no. 12: 564-9 (December, 1952).

Measurements are reported of the concentration of hydrogen sulfide and methyl mercaptan in various effluents from the Port Alberni sulfate mill. Under the operating conditions existing at the time of the survey, the blow tank and stack gases were the primary sources of odor. The other effluents were distinctly minor in comparison with these. The highest concentrations of methyl mercaptan were found in the noncondensable blow gases which occasionally showed 100,000 μg. per liter. This was a peak value and there was a considerable amount of rather erratic variation possibly resulting from variations in the blowing pressure and other causes. When the digester charge included 200 lb. of elemental sulfur, the release of malodorous substances in the noncondensable gases was increased approximately threefold. There are indications that slightly more odor is given off from a cook of Douglas-fir than from a cook of hemlock. It was not possible to measure the total volume of condensable and noncondensable gases released from the blow tank, but a rough calculation suggested that the loss of sulfur from the blow tank may have exceeded 20 lb. per cook. Under the conditions existing during the survey, the furnace gases carried only small amounts of mercaptan and hydrogen sulfide. During their passage through the cascade evaporator there was an appreciable pickup of malodorous material which escaped to the atmosphere through the stack. On the basis of estimates of the total volume of stack gas, the magnitude of the nuisance from the stack appeared to be secondary to that from the blow tank. With the low-sulfidity cooking liquor in use at the time of the survey, the effluents from the multiple-effect evaporator constituted only a minor source of nuisance in comparison with the blow tank and the stack. Other sources of odor were essentially negligible. 7 tables, 3 figures, and 6 references. E.S.

BARKERS AND BARKING

ANON. Sumner to make pneumatic debarker. Can. Pulp Paper Ind. 5, no. 12: 51-2 (December, 1952); *cf.* B.I.P.C. 22: 238-9.

The Canadian Sumner Iron Works at Vancouver, B.C. have been licensed by Söderhamn's Verkstader in Sweden to construct the Anderson pneumatic barker for the Canadian market in three sizes (for 20-, 30-, and 40-inch logs). The design and mode of operation of the barker are described briefly; it is particularly suitable for small operations which do not justify the high initial capital outlay and power consumption of the large hydraulic barkers. Preliminary experiments have shown that the Swedish barker will handle the majority of American soft-and hardwoods satisfactorily. 1 diagram. E.S.

EBERHARDT, L. Removal of bark from chip and wood pulp. Paper Trade J. 135, no. 25: 23-4, 26, 28, 30 (Dec. 19, 1952).

Two developments in the bark-removal phase for upgrading low-cost waste and low-grade raw materials are described, for which conventional barking systems are inadequate. The first development concerns a shaker-aspiration method for the removal of bark from chipped wood and involves a chip drubber for separating bark and chips and a shaker aspirator which consists of a double-deck shaker screen equipped with an air-aspiration hood; the

bark is removed without the addition of water, so that its fuel value is much higher than that obtained by any wet process. Any wood which can be chipped (sawmill or logging waste, thinnings, output of portable chippers, and crooked or cull wood) can be barked in this machine. On a laboratory scale, different hardwood and softwood species have been barked satisfactorily, although optimum operating conditions must be established for each individual species. The system is now at the point of commercial installation and field trial. The second development, the Centri-Cleaner (*cf.* B.I.P.C. 23: 107), is proven commercially, and many mill installations are operating successfully. The construction of the equipment is described briefly and applications and operating data obtained with stocks from peeled and unbarked poplars are included. 3 tables and 5 figures. E.S.

EKLUND, RISTO. Various barking and chipping methods in the forests of North America. Paper and Timber (Finland) 34, no. 11: 429-41 (November, 1952). [In Finnish; English summary]

Different portable barkers and chippers and wood- and chip-handling and transportation methods are described; reference is also made to chemical debarking methods. 3 tables, 17 figures, and 15 references. E.S.

BIOCHEMICAL TESTING

BUSCH, ARTHUR W., and SAWYER, CLAIR N. Determination of the B.O.D. of sewage and industrial wastes with the polarograph. Anal. Chem. 24, no. 12: 1887-91 (December, 1952).

This investigation was made to determine whether the polarograph can be used as a labor-saving device for the measurement of dissolved oxygen in B.O.D. determinations. The method, when using an applied voltage of −1.6 volts, was found to have an order of accuracy comparable with the standard Winkler technique. Residual current measurements were found unnecessary in the case of all the substrates and wastes studied at the concentration levels used in routine B.O.D. studies; rag-rope wastes and spent sulfite liquor were among the samples tested. The total elapsed time per determination averaged 75 seconds, which is approximately a 50% saving in time over that needed in the Winkler test when large numbers of samples are involved. In instances where radioactive samples are under study, the method will greatly reduce radiation hazards through the elimination of sample overflow and the need for titration. 6 tables, 6 figures, and 19 references. E.S.

BLEACHING

SONNI, OLAVI. The new bleach plant of the Jämsänkoski sulfite mill. Paper and Timber (Finland) 34, no. 11: 419-24, 26-8 (November, 1952). [In Finnish; English summary]

The modernization of the bleach plant built in 1934 for the system of the International Bleaching Corp. is described. The chlorination stage was entirely rebuilt and an alkaline extraction stage was added. The machinery and piping were revamped, and necessary meters and regulators were installed. Only the hypochlorite and acidification towers were not altered. The process now comprises the following stages: chlorination, alkaline extraction, hypochlorite bleach, and acidification; of these only the hypochlorite stage operates batchwise, whereas all other stages are continuous. The maximum capacity of the plant is 120 tons of airdry pulp per day. The alkaline extraction stage in particular has contributed to a considerable improvement in pulp quality. The brightness increased 2-3° G.E. with a simultaneous increase in strength.

The resin content of the pulp decreased by one third and no more pitch troubles occurred at the mill since the installation. 11 figures. E.S.

BOARD

PETZ, ALBERT. Chipboard—a new construction material. Kunststoffe 42, no. 11: 391-3 (November, 1952). [In German]

The author discusses the raw materials for the manufacture of chipboard by dry processes which find application as wallboard and in the furniture industry, the binding agents (principally urea-formaldehyde resins) employed, and methods of admixture. The most important processes and the characteristic properties of the resulting products are listed. 1 table and 6 figures. E.S.

BOARD—CONVERSION

ANON. The Robert Gair Company. Paper Box Bag Maker: 150-1 (October, 1952).

A very brief history of the Robert Gair Company, Inc., New York is given, along with a statement by a company executive on the concern's immediate business outlook. To illustrate the variety of packaging developments with which the company is concerned, a detailed description of the Bailey Engineering Co.'s double-wall chest for shipping fresh blood, packed in ice, to Korea is given; the carton is made from Gair V board. The newest plant, at Teterboro, N.J., and the largest plant, at Piermont, N.Y. are also described. 2 illustrations. L.C.

FIBRE CONTAINERS. Central Fibre's new Quincy box plant. Fibre Containers 37, no. 11: 60, 62, 64, 69-71 (November, 1952).

A detailed description of the new corrugated box plant of Central Fibre Products Co., Inc. at Quincy, Ill. and its principal installations is given, including materials-handling equipment, a Langston corrugator, and two S&S slitter-scorers. 25 illustrations. E.S.

BOARD, BOX

JACOBSEN, REINHOLD. The raw materials and processes employed in the manufacture of American folding boxboard. Allgem. Papier-Rundschau no. 21: 945-50 (Nov. 12, 1952). [In German]

Based on a visit to 31 board mills in the United States with approximately one third of the total folding-boxboard production of that country, the author describes the raw materials used, the common types of board made (bogus, bending chip, bleached manila, and patent coated), and interesting details of the construction of the cylinder machines employed. Certain differences from German practices are noted. 11 illustrations. E.S.

BOARD, LAMINATED

BOEHM, ROBERT M. Application of hardboard in veneered panels. J. Forest Products Research Soc. 2, no. 1: 100-5 (April, 1952).

The author describes the use of Masonite hardboards in veneered panels for the manufacture of furniture by either cross banding (in which the hardboard is laminated between a lumber core and the surface veneer of a thick furniture panel) (I) or by the use of the hardboard as the core in a three-ply veneered panel (II). In the manufacture of furniture tops, (I) permits simplified manufacturing procedures and savings in materials and operation.

At the same time, it offers greatly improved quality in surface characteristics, such as knot-hole bridging and the virtual elimination of interior defects. Likewise (II) used for end and back panels, drawer dividers and bottoms, mirror backs and similar applications, results in improved strength and reduced warp, without sacrifice of the internal strength characteristics of plywood, as well as in production improvements. These advantages are obtained with existing commercial laminating equipment and with presently used glues. Work is in progress on a two-ply, hardwood-veneer panel and five-ply constructions with hardboard cores. In times of diminishing log supplies, the replacement of veneers by hardboards from woods not suitable for the manufacture of veneer assumes particular significance. 3 tables and 7 figures. E.S.

BOARD SPECIFICATIONS

CHRISTOPH, KURT. Nonuniform specifications of board weights. Allgem. Papier-Rundschau no. 22: 991 (Nov. 26, 1952). [In German]

The confusion resulting from different specifications of paperboard weights by suppliers and buyers (printers or converters) is illustrated by examples, and a uniform procedure based on price per kg. or 1000 sheets is recommended; in addition the weight of the individual sheet in grams should also be listed. E.S.

BOARD TESTING—CHEMICAL

TWARDOWICZ, ALBIN H. How to test printed cartons for alkali effect. Fibre Containers 37, no. 11: 108, 110 (November, 1952).

In a progress report on the proposed alkali test for printed packaging materials (PI Printing 1p-51), the purpose of such a test is outlined; it should not replace the six-month storage test which should always be carried out, even when the ink appears to be safe from discoloration by alkali. Criticisms of the test are reviewed and examples of applications to toothpaste tubes are discussed. The need for additional data is emphasized. E.S.

BOARD TESTING—PHYSICAL

BONUTTO, A. L. Hardboard properties as affected by volatile content of resin treated fiber. J. Forest Products Research Soc. 2, no. 3: 65-71 (September, 1952).

The results of a study on some basic factors which influence the properties of hardboard (density, flexural and tensile strengths, water uptake, and swelling) are discussed, with particular emphasis on fiber volatile content—i.e., the moisture present in the fiber prior to treatment with the resin plus the resin volatiles, including water from the resin solution contained in the fiber after being treated with the resin. The smooth, two-side, ¼-inch board was prepared from dry-ground Douglas-fir fiber produced by an Allis Chalmers interplane grinder and treated with 43% resin-solids, liquid, phenolic resin. The testing procedures are outlined. Optimum properties were obtained at around 35% voltatile content which is very near the normal fiber-saturation point. It is recognized that it may not be possible to duplicate these laboratory results in commercial operation, because of the danger of blows and the required increase in pressing times. 8 figures. E.S.

MOTTET, A. L. Some observations on tests of moisture resistance of hard-pressed boards and their significance. J. Forest Products Research Soc. 2, no. 1: 36-41 (April, 1952).

To illustrate the need for further investigations on moisture-resistance tests of hardboards, the author discusses first the relation of moisture resistance to uses and the wide variations in conditions which hardboards have to meet, as well as the limitations of previous tests and specifications. He then presents a set of data obtained with 10 different kinds of hardboards, including 10 kinds and thicknesses of wet-formed, wet-pressed fiberboards, two dry-formed, dry-pressed fiberboards, three fine-granular boards, and four coarse-granular (chipboard) boards. In one case, the dimensional stability of the various specimens was measured after the samples were exposed to a change in relative humidity from 20 to 94% and, in the other, the A.S.T.M. Designation: D 1037-49 T was employed for measuring the water-resistance properties of the test boards. The resulting data are presented in tabular and graphical form. Although no specific final conclusions regarding the significance of these tests can be drawn from the limited material presented, certain broad indications are definitely apparent. No generalizations concerning the comparative water-resistance properties of different types of boards (such as granular *vs.* fibrous types, or wet-formed *vs.* dry-formed types) can be made; a wide range of properties can be found within each type. The significance of the water-absorption test is severely limited as a means of predicting the performance of different types of pressed boards in use. Wet-strength tests, linear-expansion tests, and similar procedures, as proposed in the above A.S.T.M. standard, should be more widely employed. 3 tables, 4 figures, and 1 reference. E.S.

STEL, M., JACOBS, F. M., and SCHRIEK, D. Evaluation of the punching properties of hardboards. Kunststoffe 42, no. 11: P 93-5 (November, 1952). [In German]

A method and instrument are described in which the hardness of the material to be punched can be measured at the temperatures usually employed in this work. A Hoeppler consistometer is provided with a ceramic plate which serves as a heat insulator. A two-piece copper block is placed upon the plate; it is equipped with electric heating elements with which the temperature can be raised to about 160°C. A strip of the hardboard to be tested can be slid between the two plates of the heated block; the hardness is measured by a needle placed upon the hardboard at an angle of 90° through a conical hole in the center of the block. The needle is weighted with 9 kg. and its depth of penetration into the hardboard at different temperatures (usually between 120 and 140°) is measured by means of a dial gage. Experiments with this instrument indicated that the best punching results with hardboards of the class III and IV are obtained when the boards are preheated for 5 to 10 minutes at 130-140°; these results are in agreement with practical punching experience. 2 tables and 7 figures. E.S.

BOOKBINDING

WARE, GORDON. For bookbinders only. Du Pont Mag. 6, no. 6: 8-9 (December, 1952-January, 1953); *cf.* B.I.P.C. 21: 6.

The author sketches the development of hot-melt adhesives which were adopted by bookbinders to circumvent the limitations of animal glues (handling difficulty, long drying time, climatic weakening). The subsequent development of an alkali-soluble, hot-melt adhesive which can be removed from waste paper in the reworking process, of "notch binding" to eliminate stapling, and of a special primer to prepare coated papers for hot-melt are also described. 3 illustrations. L.C.

CELLOPHANE

INSKEEP, GORDON C., and VAN HORN, PRESCOTT. Cellophane. Ind. Eng. Chem. 44, no. 11: 2511-24 (November, 1952); Tappi 35,

no. 12: 10A, 12A, 14A, 16A, 18A, 20A, 22A, 24A, 26A, 28A, 30A, 32A (December, 1952).

Cellophane was first manufactured in the United States in 1924 at an annual rate of 500,000 pounds; production in 1951 approached 300,000,000 pounds. There are now three companies (Du Pont, Sylvania Division of American Viscose Corp., and Olin Industries) which produce cellophane in the United States. The pioneer was the Du Pont company, whose newest plant at Clinton, Iowa is described in detail. The plant uses bleached sulfite pulp (principally from western hemlock and some from hardwoods) which is steeped in caustic and xanthated with carbon disulfide to form a viscose, superficially similar to, although actually quite different, from that used in the manufacture of rayon. The viscose is formed into sheets on 16 casting machines; most of the production is then coated in specially designed coating towers. The cellulose-film business has always been highly competitive with waxed paper, glassine, and other materials entering the flexible packaging market. The competition has spurred intensive research effort to improve the product and to achieve process economies, as well as to develop new fields for its use. There are today about 130 varieties of cellophane made by Du Pont to satisfy the many demands of the packaging industry and other applications, some of which are outlined. The industry has accelerated the development of automatic packaging machinery and pioneered in originating new retail marketing techniques. 6 tables, 17 figures, including 2 flowsheets, and 24 references in the first reference; only 4 figures are given in the second. E.S.

CELLULOSE—DEGRADATION

EMERTON, H. W., WRIST, P. E., SIKORSKI, J., and WOODS, H. J. Electron-microscopy of degraded cellulose fibres. J. Textile Inst. 43, no. 11: T563-4 (November, 1952); *cf.* B.I.P.C. 22: 731-2.

In a polemic referring to the captions of certain micrographs of beaten esparato grass in the preceding reference, Emerton and Wrist contest the inference that the reticulate structure derives from the oriented structure as a result of beating. They suggest that the figures in question be redesignated as fragments derived from the secondary wall in one case, and the primary wall in the other. Sikorski and Woods admit the possibility of this conjecture, but add that mechanical action can produce *pseudo*-reticulates from normal fibrous structures. The terms "lightly beaten" and "heavily beaten" were meant to refer to the degree of fibrillation and distortion seen in the fragments themselves, and not to the bulk samples from which the specimens were taken. 1 illustration. L.C.

HARTLER, NILS, and SAMUELSON, OLOF. Degradation of cotton and wood pulp with ligninsulfonic acid and sulfite waste liquor. Svensk Papperstidn. 55, no. 22: 851-62 (Nov. 30, 1952). [In English; German and Swedish summaries]

The present work deals with experiments concerning the hydrolytic action of sulfuric acid (I), high-molecular lignosulfonic acid (II), and spent sulfite liquor (III) upon free cellulose fibers (i.e., not in the form of wood chips); cotton fibers (IV) and sulfite pulp (V) were employed. At acid concentrations which give the same rate of inversion of cane sugar, (II) results in a considerably slower degradation of the cellulose fibers than (I). The experiments indicate that the cellulose regions which are accessible to the low-molecular acid cannot be penetrated by the high-molecular one. Hence, (II) attacks chiefly the surface of the fiber, whereas (I) has the ability to react also with certain inner portions of the structure. During the sulfite

cook, the waste liquor consists of a mixture of high- and low-molecular acids; despite this fact, the degradation follows, on the whole, the trends of a low-molecular acid. This can be explained by the Donnan effect. However, as far as the carboxyl content of the hydrolyzed sample is concerned, certain differences have been established between (I) and (III); the carboxyl number was somewhat higher in the experiments with (III) than in those with (I). The results presented in the experimental part of this study show that considerable differences exist in the behavior of (IV) and (V) during the acid hydrolysis. Previous authors have established that these differences result at least partly from differences in the fiber structure and that the less ordered areas are preferentially attacked during the reaction. The authors compare the rate of hydrolysis (drop in D.P.), yield of hydrolyzed cellulose, cold and hot alkali solubility, yield of cold and hot alkali-resistant cellulose, and carboxyl number of (IV) and (V) as obtained under the conditions of their somewhat different experiments. They established differences in the behavior of (IV) and (V) which have hitherto not been recorded. Particular reference is made to the viscosity (D.P.) of the cellulose as a function of the time of reaction. In agreement with previous investigators, the rate of degradation (drop in D.P.) of (IV) was found to be considerably higher in the first part of the hydrolysis. The differences are so great that the curves (D.P. *vs.* time) cross each other. However, on further hydrolysis, they cross each other a second time; during this latter part, the D.P. drops more rapidly with (V) than with (IV). 3 tables, 15 figures, and 41 references. E.S.

CELLULOSE—HOLOCELLULOSE

HARWOOD, VICTOR D. The action of acid chlorite on wheat straw. Tappi 35, no. 12: 549-55 (December, 1952).

Nine holocelluloses were prepared from wheat straw by successively increasing the time of reaction with acid chlorite from one to nine hours. Hydrolyses showed that 55% of the arabinose, 58% of the xylose, and 17% of the glucose in the original straw were removed after seven treatments. Alcohol-insoluble polysaccharides were isolated from the chlorite liquors after removal of salts by ion-exchange resins or by electrodialysis. These polysaccharides contained approximately constant amounts of glucose, arabinose, and glucuronic acid but an increasing quantity of xylose with time of reaction. The holocelluloses were nitrated and fractionally precipitated. Analyses of some denitrated fractions showed that nitrates of hemicelluloses and of cellodextrans were present in the most soluble fractions. A measure of the physical degradation of these nitrates and of the holocellulose nitrates was obtained from viscosity measurements. Chemical and physical degradation of the straw were most marked during the third hour of the chlorite treatment. 5 tables, 2 figures, and 34 references. E.S.

CELLULOSE—OXYCELLULOSE

HIRSCH, P. The acid strength of glucuronic acid in comparison with that of oxycelluloses. Rec. trav. chim. 71, no. 9/10: 999-1006 (September-October, 1952). [In English] *cf.* following abstract.

The previous investigation dealt with the acid strength of the carboxyl groups (I) in cellulose which could be COOH groups of glucuronic acid radicals. The interconvertibility of glucurone and glucuronic acid in dilute aqueous solution was therefore investigated. Neutralization curves and neutralization constants (apparent dissociation constants) of free glucuronic acid were determined and compared with those of the (I) in oxycelluloses.

Oxycelluloses were found to show a titration behavior similar to that of glucurone so that the presence of lactone or acid anhydride linkages may also be assumed in oxycelluloses. 5 tables, 2 figures, and 3 references. E.S.

HIRSCH, P. The behaviour of membranes between electrolyte solutions. III. The dissociation of carboxyl groups in cellulose. Rec. trav. chim. 71, no. 5: 525-44 (May, 1952). [In English] *cf.* B.I.P.C. 22: 565.

Former work led to the conclusion that the membrane-diffusion potential of cellophane must be connected with the degree of dissociation of acid groups in the membrane. In the present article the dissociation of carboxyl groups (I) in cellulose is investigated with the aid of neutralization curves—i.e., titration curves which show the degree of neutralization of the substance studied as a function of pH. Since initial attempts to titrate (I) in cellophane gave irregular results which were not reproducible, oxycelluloses from filter paper were employed. Some of (I) occur in a form reactive to titration (as free —COOH), whereas the remainder are unreactive and assumed to be present in anhydride form; both groups are interconvertible. When (I) are present in the reactive form, well-defined neutralization curves can be obtained; neutral salts exert a considerable influence on the titrations. The shape and position of the curves depend on the amount of (I) present in the material. Cellophane oxidized by iodine behaves like mildly oxidized cellulose from filter paper; in untreated cellophane, the (I) content was about one third of that in the oxidized sample, and the reproducibility of the titration data was poor. The law of mass action and the Donnan equilibrium as commonly formulated are not sufficient to explain the shape and position of the neutralization curves, nor is it clear in what way they are connected with the membrane-diffusion potentials. 4 tables, 6 figures, and 12 references. E.S.

CELLULOSE—REACTIVITY

ALMIN, KARL ERIK. The reaction between cellulose and heavy water. Svensk Papperstidn. 55, no. 20: 767-70 (Oct. 31, 1952). [In English; German and Swedish summaries]

The present study was prompted by the discrepancy in the data on the cellulose-heavy water reaction of previous investigators. The author followed the reaction by means of infrared spectroscopy. Completely deuterated cellulose can be obtained by hydrolyzing cellulose triacetate in a solution of sodium deuterate in heavy water. The fine structure of the 3-μ and 4-μ band was compared. Preliminary experiments on the kinetics of the reaction between cellulose and heavy-water vapor indicate that at least three stages can be distinguished which are more or less dependent upon one another. The studies will be continued. The possibility of developing a heavy-water accessibility method is discussed. 4 diagrams and 5 references. E.S.

MALM, C. J., BARKEY, K. T., MAY, D. C., and LEFFERTS, E. B. Treatment of cellulose prior to acetylation. Ind. Eng. Chem. 44, no. 12: 2904-9 (December, 1952).

In the manufacture of cellulose acetate, the cellulose is treated with acetic and/or acetic acid containing sulfuric acid prior to acetylation. Although the importance of these treatments has long been recognized industrially, the effect of variations in treatment upon the reactivity of cellulose has never been described in detail. The data found indicate that a high reactivity of cellulose toward acetylation is obtained when there is rapid and uniform sorption of the sulfuric acid catalyst. The amount of sorbed catalyst is not

as important as the uniformity of its distribution in the cellulose. This uniformity can be obtained if the cellulose is activated with acetic acid for a length of time which depends on the history of cellulose, the moisture content of the cellulose and the system, and the activation temperature. The principal function of the catalyst treatment is the reduction of the cellulose chain length prior to acetylation. Chain-length reduction of activated cellulose depends on temperature, quantity of sulfuric acid sorbed, and the moisture-content of the system. Higher cuprammonium-viscosity values are obtained if the sulfuric acid is not evenly distributed because of the insufficient activation of the cellulose. A high and uniform reactivity of the cellulose toward acetylation is necessary in order to obtain a product of high quality. An understanding of the factors affecting activation and catalyst treatment aids in selecting optimum conditions for pretreating various cellulose materials before acetylation. 15 tables, 3 figures, and 8 references. E.S.

CELLULOSE—SACCHARIFICATION

SAEMAN, JEROME F., MILLETT, MERRILL A., and LAWTON, ELLIOTT J. Effect of high-energy cathode rays on cellulose. Ind. Eng. Chem. 44, no. 12: 2848-52 (December, 1952).

Heterogeneous reactions of cellulose are in a large measure controlled by the crystalline nature of the material. In the dilute acid saccharification of forest or agricultural wastes, most of the expense and difficulty of the process is traceable to the crystallinity of cellulose. One of the means of improving the process is through the modification of cellulose crystallites. Irradiation with high-energy cathode rays causes depolymerization and decomposition of carbohydrate material to an extent dependent on the dosage. As the surface of the cellulose crystallite is not a barrier to the cathode rays, a partial disruption of this structural unit can be achieved. At a dosage of 10^8 equivalent roentgens, the sugar yield obtainable from cotton by batchwise dilute acid hydrolysis is 2.7 times that of the control, and the reaction rate is increased seventeen-fold. At a higher dosage (3.3×10^8 equivalent roentgens) decomposition occurs and the cellulose becomes water soluble. In general, the dosage of ionizing radiations required to effect a chemical change in organic compounds is too large to be of practical interest unless the system "helps." To some extent the irradiation of cellulose, followed by hydrolysis, is of this type as the change induced by irradiation causes a disproportionately large change in the yield and rate of sugar production. According to the results of this study, the dosage required to effect an improvement in the saccharification reaction is too great to be of immediate importance. The work clearly shows that reduction of the crystallinity of cellulose results in great improvement in dilute acid saccharification. 2 tables, 5 figures, and 16 references. E.S.

CELLULOSE—SORPTION

ELFVING, LENNART. Adsorption of ammonia by cellulose. Svensk Papperstidn. 55, no. 20: 794-5 (Oct. 31, 1952). [In Swedish]

Studies on the adsorption of dry ammonia gas by different cellulosic materials at room temperature showed that the quantity of gas adsorbed decreases with the α-cellulose content of the material. When different papers and viscose pulps were tested after drying the samples at 105°C. for five days, the adsorption was terminated after 48 hours. The drying conditions exerted a considerable influence upon the results. Adsorption and desorption experiments (using a spring balance with a wolfram spiral) are described in which the samples were first dried with nitrogen gas at 20°. Thin samples showed a much higher rate of adsorption than thick samples, which indicates

that diffusion processes play a part; the desorption process is much slower. The adsorption can be considered a first-order reaction, whereas the desorption cannot. When unbleached sulfite pulp was dried to constant weight with nitrogen at 20° and then exposed to ammonia gas, the latter was able to displace water still present in the pulp; this reaction could not be duplicated when the pulp was first dried with nitrogen at 100°. The similarity between the adsorption of water vapor and ammonia vapors by cellulose is pointed out. However, ammonia gas is not recommended for measuring the accessibility of cellulose (*cf.* B.I.P.C. 21: 13). 1 table, 1 figure, and 4 references. E.S.

RICHTER, G. A., HERDLE, L. E., and WAHTERA, W. E. Vapor sorption of cellulose at high relative humidities. Ind. Eng. Chem. 44, no. 12: 2883-93 (December, 1952).

The sorptive power of cellulose is an important measure of its structural composition and its behavior on subsequent processing; the present work was undertaken with the principal aim of extending this approach in the field of esterification and papermaking. The apparatus (essentially a thermostated desiccator) and the procedures employed with several acetylating grades of cotton linters and wood pulps and various other dissolving or papermaking wood pulps are described, and the results are presented in tabular form and in graphs. The sorption of water was found to be more affected by changes in fiber at 95 to 100% R.H. than at lower relative humidities. The sorption levels are shown to be dependent not only on chemical history but also on conditions and extent of water removal before testing. The sorption of organic vapors at high relative humidities was found to depend on the vapor in question and on the extent to which the fiber had been swollen at the time of exposure to the vapor. Both the rate and volume of sorption of such vapors depend upon the nature of the cellulose, and neither necessarily parallels the sorption of water by that cellulose. 15 tables, 6 figures, and 17 references. E.S.

CELLULOSE AS FODDER

FARBER, EDUARD. Vegetable aliment from wood. J. Forestry 50, no. 6: 446-9 (June, 1952).

Early attempts to prepare digestible food from wood from the 16th century to the present are reviewed. The first experimenters tried to prepare edible flours and fodder containing cooked and ground bark and wood. These efforts and the more recent progress in wood hydrolysis and saccharification and the preparation of fodder from wood waste are described. 31 references. L.C.

CELLULOSE ETHERS

HADER, RODNEY N., WALDECK, W. F., and SMITH, F. W. Carboxymethylcellulose. Ind. Eng. Chem. 44, no. 12: 2803-12 (December, 1952).

Following a brief discussion of the pertinent literature and manifold applications of carboxymethylcellulose (I), Wyandotte's patented continuous process is described which uses powdered wood cellulose (a bleached sulfite pulp) as primary starting material. The pulp is fed continuously to a large rotary reactor where it is sprayed successively with solutions of caustic soda and monochloroacetic acid. The caustic converts the cellulose to the alkali form, with which the acid reacts to supply the carboxymethyl radical as a side chain. The final product, obtained as the sodium salt, is flash-dried before shipment to consumers. Of the three hydroxyls available for substitution in each unit of the cellulose chain, an average of 0.4 to 0.8 hydroxyl per unit

is substituted, since this substitution range yields products with the most desirable chemical and physical properties. By varying the degree of substitution, the amount of depolymerization of the cellulose chain, and the pH of the final product, it is possible to provide a wide range of properties. (I) can thus be tailor-made for optimum performance in any application in which it shows promise. Brief mention is also made of the batch processes employed by the other large producers of (I), including Du Pont, Hercules, and Buckeye Cotton Oil Co. 5 tables, 2 flowsheets, 8 figures, and 14 references. E.S.

PALS, D. T. F., and HERMANS, J. J. Sodium salts of pectin and of carboxy methyl cellulose in aqueous sodium chloride. I. Viscosities. II. Osmotic pressures. III. Potentiometric titration. Rec. trav. chim. 71, no. 4: 433-67; no. 5: 513-20 (April, May, 1952). [In English]

I. The extrapolation of the specific viscosity/concentration *vs.* concentration curves (I) for polyelectrolytes in dilute salt solutions is difficult, because these curves exhibit a sharp maximum where the equivalent concentration of the polyelectrolyte is of the same order of magnitude as that of the extraneous salt. A more reliable figure for the intrinsic viscosity can be obtained if the effective ionic strength is kept constant or nearly constant, in which case (I) becomes a straight line. The intrinsic viscosities of the pectinate (II) and three samples of carboxymethylcelluloses (III) in aqueous solutions of sodium chloride are discussed. A study of the effect of surface tension in viscometry is described, which led to the conclusion that, for the purpose of this investigation, an Ubbelohde viscometer is preferable to an Ostwald viscometer. The intrinsic viscosity of the polyelectrolytes investigated was found to be a function of the shear-rate. This phenomenon will be more fully discussed elsewhere. II. A Fuoss and Mead osmometer was used to determine the molecular weights of (II) and (III) in aqueous sodium chloride solutions. The change of osmotic pressure with polymer concentration and salt content was also studied. The reduced osmotic pressure proved to be a linear function of the polymer concentration. The slopes of the osmotic pressure/concentration *vs.* concentration curves vary with the concentration of the sodium chloride in a manner which is in reasonable agreement with the Donnan equilibrium. III. By comparing their intrinsic-viscosity data with potentiometric titration values, the authors found that the changes in pH in the titration of (II) and (III) are much larger than those derived from their study of molecular dimensions. The possible causes of this discrepancy are discussed, including the difference in H-ion concentration inside and outside the polymer coil, fluctuations in the end-to-end distances, and the effect of polyelectrolytes on the activity coefficients of the electrolytes used. 16 tables, 17 figures, and 42 footnotes. E.S.

CELLULOSE FILMS, TRANSPARENT

RIDDELL, G. L. Plastic films. J. Inst. Packaging 2, no. 16: 137-42 (2nd quarter, 1952).

The following plastic films are covered: cellulose acetate, cellulose acetate-butyrate, cellulose nitrate, cellulose transparent film (cellophane, Rayophane, Diaphane, Sidac, etc.), ethylcellulose, nylon, polyethylene (polythene and Alkathene), saran (polyvinylidene chloride), polyvinyl chloride, and Pliofilm (rubber hydrochloride). These materials are discussed in reference to the scope of their use, their cost, the functions they are called upon to perform, their strength properties and decorative qualities, and the effects produced on them by creasing. The films are evaluated for protective properties, such as water-vapor and gas resistance, odor and flavor retention or transmission,

and resistance to liquids, grease, light and heat passage, and to mold and insect attack. 9 tables. L.C.

CHEMICAL TESTING—CARBOHYDRATES

BRIDGES, ROBERT ROY. Quantitative determination of pentoses with anthrone. Anal. Chem. 24, no. 12: 2004-5 (December, 1952).

The use of the anthrone reagent, previously shown to be suitable for the quantitative determination of hexoses, has been extended to the quantitative determination of pentoses by employing a simple modification of operating technique (immediate cooling followed by restoration to room temperature). Hexoses will interfere if they are present; therefore, the operating conditions as they now stand apply only to pentose sugars. 2 figures and 6 references. E.S.

CHEMICAL TESTING—CELLULOSE—FRACTIONATION

ROSENTHAL, A. J., and WHITE, B. B. Fractionation of cellulose acetate. Ind. Eng. Chem. 44, no. 11: 2693-6 (November, 1952).

The solubility of cellulose acetate in solvent-precipitant systems depends to various extents on the interaction of acetyl value and intrinsic viscosity. A cross-fractionation scheme was developed to produce cellulose acetate fractions with narrow acetyl-value and intrinsic-viscosity distributions. By titrations of solutions of these fractions to the saturation point with various precipitants, the acetyl-value dependence and intrinsic-viscosity dependence of the solubility in many solvent-precipitant combinations were determined. The results make it possible to select solvent-precipitant combinations which will fractionate cellulose acetate selectively according to chemical composition or intrinsic viscosity. The application of similar cross-fractionation techniques to other polymers which possess both chemical and chain-length distribution (copolymerization products) is suggested. 7 tables, 3 figures, and 8 references. E.S.

CHEMICAL TESTING—INK

TOLLENAAR, D. Chemical aspects of ink drying. Erratic drying of offset inks. Intern. Bull. for the Printing and Allied Trades no. 61: 43 (July, 1952).

This study is an extension of the work by Reed on the retarding effect of the pH of the paper on the drying of offset inks (*cf.* B.I.P.C. 15: 416). The pH of 40 commercial papers was tested; all coated papers were found to be alkaline and all uncoated papers were acid. The former gave shorter ink-drying times than the latter. When tested at 90% R.H., no appreciable difference in drying time was found with the alkaline papers, whereas the acid papers dried very slowly at the high humidity. Finally, the drying time of a group of specially prepared uncoated papers varying in pH from 3 to 9 was tested, and the same relation between pH and drying time was found to hold. The pH is concluded to play a predominant part in the drying of offset inks, although the exact mechanism is not quite clear. It may be that the adsorption of the metal ions of the siccatives is influenced by the pH. 1 diagram. E.S.

CHEMICAL TESTING—PHOTOGRAPHIC PAPER

SÈVE, R. Analyses and tests on sizing agents used in photographic papers. Papeterie 74, no. 11: 715, 717, 719, 721, 723 (November, 1952). [In French]

Rosin (I), gelatin (II), casein (III), and melamine resin (IV) (or related synthetic resins) can be isolated from photographic papers (V) by suitable extractions and subsequently identified by specific tests. The methods are qualitative, but could probably be made quantitative. (I) was extracted by refluxing (V) with ethyl alcohol containing a few drops of acetic acid and was identified by the Liebermann-Storch reaction with acetic anhydride and sulfuric acid. Inasmuch as (II), as well as small amounts of (III), are extracted from (V) by boiling water, a buffered solution (pH 4 to 4.5) at about 80°C. was used. Under these conditions (III) remained almost insoluble, whereas (II) dissolved. The solution of (II) was hydrolyzed with aqueous hydrochloric acid to amino acids which were tested for by the ninhydrin reaction. (II) could be detected in the extract by precipitation with tannin, followed by a Kjeldahl determination (*cf.* Abribat, Pouradier, David, and Venet, Chim. anal. 33: 245-7 [1951]). After removal of (II), (III) was extracted from (V) by an aqueous solution buffered to pH 10, preferably using ammonium hydroxide and ammonium chloride. In this extraction (after evaporation, careful ashing, and treatment with nitric acid), the phosphoric acid arising from (III) was determined as the phosphomolybdate. (IV) in the pre-extracted (V) was removed by heating with glacial acetic acid, evaporating to dryness, and subliming *in vacuo* at 300°, thus giving characteristic melamine identified by its crystalline structure and by its greenish-yellow fluorescence under ultraviolet light. This fluorescence is also shown by the acetic acid extract of (IV). Present-day, rather limited methods of determining the degree of sizing in (V) are discussed briefly. 24 references. L.E.W.

CHEMICAL TESTING—PULP—LIGNIN VALUE

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Acid-insoluble lignin in wood pulp. Tappi 35, no. 12: 128-9A (December, 1952).

The text of the corrected Tentative Standard T 222 m-50 (previously published under the title "Lignin in wood pulp") is presented for criticisms and comments. 1 figure and 2 references. E.S.

CHEMICAL TESTING—PULP—PENTOSANS

JOHANSSON, AXEL. The determination of pentosan. Svensk Papperstidn. 55, no. 21: 820-8 (Nov. 15, 1952). [In English]

The experiments leading to method CCA24 (*cf.* B.I.P.C. 21: 618) are described. The hydrobromic acid distillation procedure and the aniline colorimetric method for furfural were found unsuitable. The colorimetric orcinol method was developed, and the pertinent experimental factors were studied. The pulp is distilled with hydrochloric acid and salt according to Kullgren-Tydén (*cf.* Ing Vetenskaps. Akad. Handl. no. 94) and the amount of furfural produced is determined after development of the color with orcinol by measurement of the absorbance at 6300 A. The effect of hydroxymethylfurfural can be compensated for after making a second absorbance measurement at 3900 A. A rapid procedure, which is a modification of method CCA24, is described; it may be employed when an error of 5% in the pentosan content is permissible. 7 tables, 9 figures, and 21 references. B.L.B.

CHEMICAL TESTING—WOOD—MERCURY

SANDERMANN, W., SCHÄRFE, E., and CASTEN, R. A method for the colorimetric determination of mercury in kyanized wood and technical pulp products. Holzforschung 6, no. 2: 42-3 (1952). [In German]

When Johansson's colorimetric dizithone method (*cf.* B.I.P.C. 20: 858-9) was applied to the mercury determination in kyanized wood, a large percentage of the mercury was lost during the wet combustion of the samples with a mixture of concentrated sulfuric and nitric acids. The authors found that these losses can be avoided when the wet combustion is carried out under a reflux; an additional advantage of the modified method is that the nitric acid need not be removed after decomposition, as prescribed in the original procedure. The method is also suitable for determining mercury in groundwood, chemical pulp, paper, and spent liquor. 1 table and 2 references. E.S.

CHIPS

HUBERT, ERNEST E. Utilization of slash by chipping. J. Forest Products Research Soc. 1, no. 1: 55-6 (September, 1951).

The utilization possibilities of tree residues left after logging are outlined. The economical features involved in chipping slash on the logging area and transportation to manufacturing plants are discussed. E.S.

MCINTYRE, ARTHUR C. Wood chips, wood chippers and conservation farming. J. Forest Products Research Soc. 2, no. 2: 65-9 (June, 1952); *cf.* B.I.P.C. 21: 389.

The author discusses the possibilities of wood chips used as a chicken litter, animal bedding, compost material, mulch for crops, a soil blanket to prevent erosion, and as a soil conditioner or amendment. E.S.

CHROMATOGRAPHY

MICHEEL, FRITZ, and VAN DE KAMP, FRANZ-PETER. The separation of sugar mixtures by combined electrophoresis and paper chromatography. Angew. Chem. 64, no. 22: 607-8 (Nov. 21, 1952). [In German]

Sugar mixtures were converted into boric acid complexes and subjected to electrophoresis on a filter paper, using a downward flow of solution. The fractions were collected and each of these was chromatographed by the usual procedure. Effective separations were obtained with known mixtures of cellobiose, mannose, rhamnose, and glucose. With the hydrolyzate of inulin, it was possible to separate and recognize about 5% of glucose in the presence of the great excess of fructose. 5 figures and 5 references. L.E.W.

COLOR-BLINDNESS

WRIGHT, W. D. New studies on defective colour vision. Nature 170, no. 4335: 904-6 (Nov. 29, 1952).

The three-receptor theory of color perception is discussed, with particular reference to the various types of color blindness. The results of a newspaper survey and of subsequent laboratory tests indicate that one form of defective color vision (tritanopia) is considerably more common than was previously supposed. Evidence is cited in confirmation of the hypothesis that tritanopia is due to the absence of blue receptors. K.C.H.

COLORIMETRY

WRIGHT, W. D. U. S. color science speeds up. Modern Textiles 33, no. 12: 33-4, 61, 70 (December, 1952).

American and British techniques in the science of color are described and contrasted. The author compares the merits of mechanical and visual methods

of color analysis, matching, and reproduction, and comments on recent research in color vision by physicists and psychologists. 1 illustration. K.C.H.

CONVERSION FACTORS

ANON. The basis weight as Anglo-Saxon designation of paper weight. Allgem. Papier-Rundschau no. 19: 869-70 (Oct. 13, 1952). [In German]

Calculations and examples for the conversion of the square-meter weight in grams to basis weight in pounds per ream are given. 1 table and 1 diagram. E.S.

CORROSION

ANON. Sulphite digester inspection. Tappi 35, no. 12: 132-4A (December, 1952).

A foreign correspondent is asking for the American practice in checking the corrosion of sulfite digester shells apparently in sound condition without the removal of a patch in the lining (which consists of layers of acid-resistant pitch, refractory tiles, a special thermoplastic compound, and carbon [Carblox] tiles embedded in a special mortar). All answers agree that the removal of a patch for inspection would not be correct. The best evidence for satisfactory digester conditions is the presence of a dry lining after a blow. Ultrasonic and radioactive measurements are also recommended. E.S.

GOW, JAMES T. Corrosion resistant alloys. Pulp and Paper 26, no. 13: 96, 98, 100, 102 (December, 1952); *cf.* B.I.P.C. 22: 821.

The author discusses the commercially available alloys for use with corrosive solutions in the pulp and paper industry under the three headings: iron-chromium alloys, iron-chromium-nickel alloys, and nickel-base alloys. The correct selection for satisfactory service under corrosive conditions is described. 1 table. E.S.

LIENTZ, JAMES R. Digester corrosion; progress as reported at Chicago. Pulp and Paper 26, no. 13: 33-4 (December, 1952).

The author reviews the reports and sessions on the kraft digester corrosion problem at the Chicago Engineering Conference, held on Oct. 13-16, 1952. Particular attention was given to the discussion of techniques recommended by the committee for measuring and reporting corrosion rates. Experiences with alloys as well as problems concerning maintenance and repair of existing digesters were also discussed. E.S.

COST—ACCOUNTING

ELLIOTT, NORMAN J. Pricing and estimating. Article 4. Use of budgets in cost applications. Boxboard Containers 70, no. 720: 44-6, 54 (December, 1952); *cf.* B.I.P.C. 23: 245.

The two general types of expense-cost-operating budgets, the fixed and flexible types, are described. Both can be used to provide the basis for establishing machine and handwork hourly cost rates. The flexible budget is the more accurate method, not only for establishing a basic set of rates, but also for establishing the variations of those rates according to different levels of production. With either method, operating results should be compared with the budget, and such an analysis should include comparisons of projected and actual machine and handwork hours, as well as the absorption of over-

head accomplished through the use of established cost rates during the periods under review. The application of the Manning table for use in the boxboard-container industries is also discussed. 3 illustrations of analysis tables. L.C.

COTTON

DAUL, GEORGE C., REINHARDT, ROBERT M., and REID, J. DAVID. Studies on the partial carboxymethylation of cotton. Textile Research J. 22, no. 12: 787-92 (December, 1952); *cf.* B.I.P.C. 19: 156.

Additional studies have been made on partial carboxymethylation—the reaction between monochloroacetic acid and cotton in the presence of sodium hydroxide—and on the products obtained. A thorough investigation of the time and temperature of the reaction and concentration of reagents showed that relatively small amounts of monochloroacetic acid, properly applied, alter the properties of cotton considerably. Pilot-scale carboxymethylation of cloth was conducted which showed that it is possible to use standard textile machinery in the process. The cloth resulting from this treatment had a crisp hand with a slightly starched feel. More detailed investigations than reported previously were made, and it was found that the tensile strength and elongation of treated cotton are increased, dyeing properties are changed, and soiling-resistance and soil removal are increased. It was also learned that the treated materials are unaffected after one year's storage. 4 tables, 1 figure, and 15 references. E.S.

DIELECTRICS

BIRDSALL, H. A. Insulating films. Digest of the Literature on Dielectrics (Natl. Research Council) 15: 130-9 (1951, publ. 1952); *cf.* B.I.P.C. 22: 189.

A summary of the literature on paper, textile, and plastic insulation in the form of thin sheets for 1951 is presented under the subdivisions: general dielectric properties, thermal stability, capacitors, paper-base laminates, vulcanized fiber, sheet insulation from noncellulosic fibers, and plastic sheet insulation. 45 references. E.S.

DIELECTRICS—TESTING

BERG, ERICH. Testing of resistance to creepage flash-over from the practical viewpoint. Kunststoffe 42, no. 9: 257-60 (September, 1952). [In German]

The faults of previously used test procedures are noted. A new procedure is described in which the creepage flash-over is produced on the dry surface and on the surface moistened by contact with water vapor. 1 table, 9 figures, and 1 reference. G.R.S.

DEUTSCHER NORMENAUSSCHUSS. *Fachnormenausschuss Kunststoffe.* Testing of insulating materials. Determination of the resistance to creepage flash-over. Kunststoffe 42, no. 9: 261-5 (September, 1952). [In German]

The text of the tentative German standard DIN 53,480 for determining the resistance to creepage flash-over is given; it permits one of three different treatments of the test surface—i.e., contact with solutions of Nekal BX (alkylnaphthalenesulfonate) by the drop or immersion procedures, or moistening by contact with water vapor. Knife electrodes are used. 4 tables, 5 figures, and 4 footnotes. G.R.S.

OLYPHANT, MURRAY, JR. Arc resistance: (II) Effect of testing conditions on tracking properties of thermosetting insulating materials. ASTM Bull. no. 185: 31-8 (October, 1952); *cf.* B.I.P.C. 22: 737.

The conditions under which the arc-resistance properties of materials are determined can be varied by changing either the nature of the test atmosphere, the form of the electrode arrangement, or the nature of the discharge. The results of tests (in which the same specimens were used as in Part I) are presented; they reveal that materials in general are more resistant to tracking under arcs in nitrogen, hydrogen, and helium, and less resistant in an atmosphere containing 5% chlorine, than they are in air alone. Arc resistance is shown to decrease with increasing specimen temperature; the rate of decrease varies somewhat among materials. Studies of comparative tracking properties under continuous current arcs, raised electrode conditions, and pulse arcs, and their results are discussed. Power is concluded to be a more basic factor in determining breakdown than is arc current; particular values of arc power were calculated from the energy consumed in the promotion of tracking, at which the phenomenon is most efficiently initiated. 7 tables, 6 figures, and 6 references. E.S.

WOEBCKEN, W. Drop procedure for evaluating the resistance of insulating materials to creepage flash-over. Kunststoffe 42, no. 9: 253-6 (September, 1952). [In German]

The author describes a test procedure which employs an automatic drop dispenser for applying solutions of Nekal BX (sodium alkylnaphthalenesulfonate) to the test surface. The surface patterns resulting from the flash-over under different conditions are illustrated. 8 figures and 12 references. G.R.S.

FIBER—TESTING

DART, LEONARD S., and PETERSON, L. E. An improved vibroscope. Textile Research J. 22, no. 12: 819-22 (December, 1952); *cf.* B.I.P.C. 19: 591.

An improved model of the constant-frequency type vibroscope used for measuring single fiber denier is described in detail. This vibroscope has a least count of 0.01 denier, which corresponds roughly to about 0.03 μg. weight in a 1-inch sample. The improvements incorporated into this new model pertain primarily to its speed and ease of use. A description of the important parts is included, and some illustrative data are shown. 2 tables, 2 figures, and 3 references. E.S.

FIBERS

ELFVING, LENNART. "Sulfite pulp" through fungus attack of wood. Svensk Papperstidn. 55, no. 21: 848 (Nov. 15, 1952). [In Swedish]

Wood fibers attacked by *Polyporus annosus* (I) under favorable conditions for the development of the fungus (the lignin was preferentially and principally degraded) were investigated with regard to their physical and chemical papermaking properties. (I) could not be differentiated from bleached sulfite pulp by staining; the Herzberg, Selleger, Lofton-Merritt, and Stocker stains, as well as indophenol, gave the reactions typical for bleached sulfite, but did not show the characteristic veining of sulfite fibers treated with Herzberg's stain. This lack of differentiation may give misleading

results—for instance, in the determination of fibers in effluents. Laboratory sheets prepared from (I) after a short beating period had a breaking length of 7300 m.; this is higher than the usual values obtained with unbleached sulfite. Tear and folding endurance, on the other hand, were very low. The chemical properties of (I) were studied on three samples: A (extracted with water vapor at 100°C.), B (A subsequently extracted with acetone and chloroform), and C (B treated with chlorine dioxide). The results are presented in tabular form. The alkali solubility of the unbleached and bleached samples did not vary appreciably; the high content in pentosans (2.98, 3.15, and 3.14%, respectively) indicates a mild attack. The viscosity values correspond to those obtained with viscose pulps. The amount of lignin present, calculated from absorption spectra (*cf.* B.I.P.C. 22: 488), corresponds to about 1-2% Klason lignin. Since the primary cell walls of (I) are usually not degraded, these naturally delignified fibers are suggested as a suitable material for fiber-structure studies. 1 table and 1 reference. E.S.

FINANCE

RUMPF, A. NEWELL. Yesterday, today, and tomorrow. Tappi 35, no. 12: 50A, 52A, 54A, 56A, 58A (December, 1952); *cf.* B.I.P.C. 22: 249-50.

The author reviews the reasons for the low activity of the past year following the rush of buying of a hoarding nature at the beginning of the Korean hostilities and present trends since excess inventories in the hands of users have been liquidated. The three factors which give concern to the banker when viewing the industry's future—i.e., taxes, cost of replacement of machinery, and expansion—are discussed. Planned new capacity through 1955 is 2,304,000 tons over December, 1951; this represents a 12% increase in paper and a 15% increase in board. Some of this may be canceled or delayed, but one is prone to wonder whether all of this new capacity can be put to profitable use. The two bright spots in the picture are the fact that no business can be conducted without paper and that no single industrial or commercial activity can take place without it, and that at present no economic substitutes for paper and paperboard exist; on the contrary, the two materials are the economic substitutes for wood, tin, glass, metals, textiles, and a host of others. 2 tables. E.S.

FOLDING BOXES

DENNY, J. L. A user's views on folding boxboard cartons in factory and shop. J. Inst. Packaging 2, no. 15: 106, 108 (1st quarter, 1952).

The author presents the advantages and disadvantages of the folding box to both the packager and the retail handler and points out that the minor disadvantages, though numerous, are nevertheless outweighed by the fact that the cartons fold and stack flat. The need for proper air conditioning of the blanks is discussed, and suggestions for storing them are given. L.C.

FOLDING BOXES, SIFTPROOF

CUPO, WILLIAM J. Vacuum sealing of folding cartons. Modern Packaging 26, no. 4: 149-52, 203, 205 (December, 1952).

A method has been devised for the siftproof sealing of the top flaps of conventional seal-end cartons. The new vacuum-sealing principle recognizes the fact that an effective seal is impossible without direct pressure on both sides of the sealing area; a vacuum created over the outer surface of a

filled carton causes the air in the space over the product to push upward on the top flaps and supply the necessary pressure for a good seal. Only a slight modification in carton design and machinery is necessary to install vacuum sealing. Suction heads can be substituted for the nozzles of a rotary-type filling machine, or a series of suction heads in tandem can be installed between the top sealer and a conventional, but shortened, conveyor belt. The method provides a seal which allows not even talcum to sift out and keeps small insects from entering the carton. The forming time of the seal is considerably shortened, and the use of thermoplastic sealing compounds in place of present adhesives is made possible. 7 figures. L.C.

FORESTS AND FORESTRY

AMIDON, GEORGE. Outlines forestry operations at Mando. Paper Trade J. 135, no. 25: 18, 48 (Dec. 19, 1952).

The sustained-yield forestry methods of the Minnesota and Ontario Paper Co. are outlined. Large management districts have been divided into small woodlot units which are readily adaptable to intensive management. Some of the obstacles to the company's long-term cutting plans and problems of the oversupply of mature wood in some districts and of certain less valuable species in others are indicated. About 40% of the company's total needs in both Minnesota and Ontario comes from the 52 sustained yield units. L.C.

BRITISH COMMONWEALTH FORESTRY CONFERENCE. Summaries of papers presented at Commonwealth Forestry Conference. Pulp Paper Mag. Can. 53, no. 12: 152, 154, 157; no. 13: 138, 140, 142, 144, 146 (November, December, 1952).

Abstracts are given of the papers which were presented at the sixth conference, held from August 11 to September 13, 1952 in Canada. L.C.

GIDDINGS, EDWIN L. Timber resources [of New England] Ind. Eng. Chem. 44, no. 11: 2527-9 (November, 1952).

Statistical data on the supply of timber available for industry in New England are given which indicate that the region is heavily forested, despite widespread opinion to the contrary. Shortages of individual species and varieties of timber exist in certain localities; however, there is for the entire region an excess of growth over drain, particularly in hardwoods. Applications have been made for the construction of additional pulp-mill facilities which will utilize some of this excess. More intensive timberland-management practices are becoming evident; more roads are needed and will be built to open up certain hitherto inaccessible logging areas. In addition to standing timber, there is a considerable volume of slabs, sawdust, and shavings not utilized at present, for which uses may eventually be found. 6 tables and 1 figure. E.S.

FUEL

EDLING, GUSTAF. Can a pulp mill be made self-supporting with regard to fuel? Svensk Papperstidn. 55, no. 22: 863-8 (Nov. 30, 1952). [In Swedish]

The author discusses the possibilities for Swedish sulfate and sulfite mills to cover their fuel requirements through the recovery and combustion of their spent liquors. Heat balances are presented based upon data gathered by the Swedish steamboiler association during recent years. Emphasis is

placed upon the fact that a successful solution does not depend only upon local conditions, modernized mills, and new installations, but upon the regular strict control of the entire heating process. New possibilities for heat savings must constantly be sought. Sulfate mills are in a better position to become self-supporting than sulfite mills although, under certain favorable conditions, the latter might also achieve this goal. By the efficient use of the spent liquors, the author estimates that the Swedish pulp industry might save 800,000 tons of coal per year. 6 tables and 3 figures. E.S.

GASES—ANALYSIS

FELICETTA, V. F., PENISTON, Q. P., and MCCARTHY, JOSEPH L. Determination of hydrogen sulfide, methyl mercaptan, dimethyl sulfide and disulfide in kraft pulp mill process streams. Can. Pulp Paper Ind. 5, no. 12: 16, 18, 20, 22, 24, 26-7, 30, 41 (December, 1952).

The mass-spectrometer examination of the volatile components in the condensate from kraft-pulp, digester-blow gases has confirmed the presence of hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide, and has shown that corresponding ethyl compounds and other sulfur-containing derivatives are not present in substantial concentrations. A relatively simple and rapid method for the quantitative determination of each of the four above-named components in gas or condensate streams has been developed. The two acidic substances are batch absorbed into aqueous sodium hydroxide solution, whereas the two thio ethers are simultaneously taken up in benzene; the liquid phases are then separated. The quantitative determination of hydrogen sulfide and methyl mercaptan in the alkaline aqueous solution is carried out using potentiometric titrations with silver nitrate. The quantitative determination of dimethyl sulfide and disulfide in the benzene solution is carried out by conducting bromate-bromide titrations of the components after having partly separated them by a single-stage batch distillation. Results obtained on known mixtures of substances are set forth. The method has given reasonably satisfactory analyses of two gas and two condensate process streams in a kraft-pulp mill. 5 tables, 5 figures, and 8 references. E.S.

HARD WOODS

LOGAN, D. V. Dissolving pulp from southern hardwoods. J. Forestry 50, no. 6: 483 (June, 1952).

The author demonstrates the commercial value of dissolving pulps from southern hardwoods by the sulfate process first produced by the International Paper Co.'s new rayon-pulp mill at Natchez, Miss. This new use of hardwoods makes possible a more balanced cutting in the southern woodlands. The market and demand for dissolving pulp are so extensive that future possibilities are unlimited. L.C.

RIOUX, LAURENT. Utilization of hardwoods. Pulp Paper Mag. Can. 53, no. 13: 115-16, 119; discussion: 119, 121 (December, 1952).

The author reviews the history of the rise in the utilization of hardwoods for pulp and warns against rapid depletion of its supply. He recommends the formation of co-operatives among small woodlot owners who would be instructed in the best silvicultural methods by paper-company representatives. Small brokers do not apply these methods. L.C.

HISTORY

ANON. Back room boys of the paper trade (1). Paper Making and Paper Selling 71, no. 3: 9-13 (Autumn, 1952); *cf.* B.I.P.C. 22: 744.

This article, a resume of "A century and a half of wire weaving," a pamphlet on the progress of C. H. Johnson & Sons, Ltd., Manchester, England, is essentially the same as the previous reference. 7 illustrations. L.C.

VAULTIER, ROGER. Letter papers and envelopes of long ago. Papetier 6, no. 11: 95-8 (November, 1952). [In French]

The author describes the trends and fashions in French letter paper and envelopes since paper started to replace genuine parchment, which was at first generally employed for this purpose. Toward the end of the 16th century, letter paper was well established in France. Colored, perfumed, and lavishly decorated papers and envelopes (either hand-painted or with rich gold ornaments) of the different periods are described and supplemented by four illustrations. E.S.

HUMIDITY

MURRAY, JAMES A. Apparatus for producing high humidity. ASTM Bull. no. 186: 47-8 (December, 1952).

An apparatus for providing humidities of 95% or higher without the disadvantages encountered in either the spray method or the use of steam is described; it is an adaptation of a laboratory aspirator used as an air pump to a large-scale problem. The essential part consists of a six-inch Schuette Koerting fume scrubber mounted on a rectangular tank; water from this tank is continuously recirculated by means of a centrifugal pump installed outside the humidified room. The water passes through a spray nozzle into the scrubber and, on passage through the Venturi throat, induces air through the inlets. The air is released in the receiving tank where it frees itself of entrained water and discharges through four three-inch elbows directed toward the corners of the room. Temperature control is also provided and installed outside the humidity room. After eight months of continued operation, the equipment has required no maintenance other than the periodic lubrication of the motor driving the circulating pump. 1 table and 1 diagram. E.S.

ILLUMINATION

ANON. Lighting of paper mills. Rev. papiers et cartons 15, no. 19: 7-8 (Oct. 1, 1952). [In French]

The advantages of adequate illumination, such as higher productivity and reduced fatigue of workers, in the different departments of paper mills are outlined. The correct application of incandescent, fluorescent, and mercury-vapor lamps is explained. 2 illustrations. E.S.

WINKLER, H. Fluorescent lighting in the paper industry. Allgem. Papier-Rundschau no. 19: 862-5 (Oct. 13, 1952). [In German]

The advantages of fluorescent over incandescent lights in the illumination of a paper-machine room are described where particular emphasis was placed on the visibility of the traveling paper web during all stages of manufacture. The problems and details of this particular installation are outlined. 4 figures. E.S.

KENAF

ANON. Kenaf—the strategic fibre. Paper Making and Paper Selling 71, no. 3: 6-8 (Autumn, 1952).

The kenaf plant (*Hibiscus cannabinus* L.), variously known as Bimlipatam jute, Ambari or Deccan hemp, and Mesta, has properties which make it a suitable substitute for jute and a possible raw material for paper manufacture. It grows well in almost any locale of moderate climate and does not require the ideal conditions and soils which are necessary for jute. The harvesting, retting, and decorticating of kenaf are described. 5 illustrations. L.C.

LABORATORIES

ENGELER. The "Istituto di Patologia del Libro" in Rome. Textil-Rundschau 7, no. 10: 479 (October, 1952). [In German] *cf.* B.I.P.C. 22: 532.

In connection with a meeting of Swiss librarians in Winterthur in September, 1952, reference is made to an exhibit displayed by the Istituto di Patologia del Libro which illustrated the activities of this unique Italian institution. E.S.

FEHRLIN, A. The activities of the paper division of the Eidg. Materialprüfungs- und Versuchsanstalt in St. Gallen. Textil-Rundschau 7, no. 11: 527-9 (November, 1952). [In German] *cf.* B.I.P.C. 20: 804.

The principal activities of the paper division of the Swiss national bureau of standards are outlined, including chemical and physical paper testing, evaluation of printing papers and packaging materials, and the development of standard testing procedures. A few typical examples of problems are given with which the bureau has to deal (cooking of straw pulp suitable for paper manufacture; testing procedures for bags, spinning paper, and anti-tarnish tissue wrappings; evaluation of special food wrappings; and required properties of safety papers). E.S.

LEATHERBOARD AND ARTIFICIAL LEATHER

MATAGRIN, AM. Artificial leathers (types, recent progress, and outlook). Papeterie 72, no. 11: 582, 585, 587, 589, 591, 593, 595; no. 12: 657, 659, 661, 663 (November, December, 1950); 73, no. 3: 127, 129, 131, 133-5; no. 4: 199, 201, 203, 205; no. 5: 269, 271, 273, 275, 277; no. 6: 309, 311, 313, 315; no. 7: 383, 385, 387; no. 8: 441, 443, 445, 448, 451; no. 9: 493, 495, 497, 499, 501; no. 11: 629, 631, 633, 635, 637, 639; no. 12: 701, 703, 705-7 (March-September, November, December, 1951); 74, no. 1: 15, 17, 19, 21, 23; no. 2: 95, 97, 99, 101, 103, 106; no. 3: 153, 155, 157, 159; no. 5: 297, 299, 301, 303, 305; no. 6: 371, 373, 375, 377, 381; no. 7: 433, 435, 437, 439; no. 10: 672-3, 675; no. 11: 729, 731, 733, 735, 737, 739 (January-March, May-July, October, November, 1952). [In French]

This is an extensive review of the subject, including a historical introduction and a discussion of the materials employed (regenerated genuine leather and bases of animal or cellulosic native or synthetic textile fibers, lignocellu-

lose, pulp, paper, or board; impregnating agents, such as animal sizes and other colloidal proteins, vegetable sizes and mucilages, cellulose esters and ethers, bituminous substances and waxes, synthetic resins, and natural and synthetic rubbers; mineral fillers; and chemical modifying agents), methods of application, and machinery. 434 footnotes, a large number of which refer to patents. E.S.

LIGNIN

BLAND, D. E., HILLIS, W. E., and WILLIAMS, E. J. Prediction curves for counter-current separations: application to lignin aldehydes. Australian J. Sci. Research. Ser. A. 5, no. 2: 346-67 (1952).

A theoretical investigation of the separation of pairs of solutes in a countercurrent distribution train has been made. The results are presented as families of curves from which may be read the number of transfers necessary to effect a 95 or a 99% separation of a pair of substances of known partition coefficients. The applicability of the curves has been verified when used to predict the number of transfers necessary for the separation of aromatic aldehydes from the oxidative decomposition of lignins. No relation between R_F value and partition coefficient could be established for the solvents investigated. 3 tables, 4 figures, and 14 references. E.S.

FLETCHER, T. L., and HARRIS, ELWIN E. Products from the destructive distillation of Douglas-fir lignin. Tappi 35, no. 12: 536-9 (December, 1952).

Lignin obtained as a residue in the hydrolysis of Douglas-fir sawmill waste was pyrrolyzed at 400 to 445°C. in about 7.5 hours, yielding 53 to 64.6% of char, 15 to 25% of aqueous distillate, a settled tar, and gases. Settled and dissolved tar was removed from the aqueous distillate and separated into organic acids, phenolic compounds, and neutral oils. Nine organic acids and 11 phenolic compounds were fractionated and identified. Pyrrolysis of wood-saccharification lignin offers a means for producing high yields of char which can be briquetted or activated. It also provides a source of organic acids and phenolic compounds with potential value in plastics or organic intermediates. 4 tables, 2 figures, and 5 references. E.S.

LEOPOLD, BENGT. Studies on lignin. XIV. The composition of Douglas-fir wood digested by the West Indian dry-wood termite (*Cryptotermes brevis* Walker). Svensk Papperstidn. 55, no. 20: 784-6 (Oct. 31, 1952). [In English] *cf.* B.I.P.C. 22: 748-9.

The composition of the feces of the West Indian dry-wood termite fed on Douglas-firwood has been studied. The material was subjected to sulfonation and nitrobenzene-alkali oxidation. During the short passage of the wood through the digestive tract of the termite, the carbohydrates are preferentially assimilated. Most of the lignin is left in a fairly unchanged condition which gives vanillin yields almost as high as those from the fresh wood. 3 tables, 1 diagram, and 10 references. E.S.

LEOPOLD, BENGT. Studies on lignin. XVI. Nitrobenzene oxidation of methylated lignins. Svensk Papperstidn. 55, no. 21: 816-19 (Nov. 15, 1952). [In English]

The influence of methylation of lignin with various reagents on the yield of vanillin obtained on subsequent oxidation with nitrobenzene and alkali has been studied. It is shown that methylation with dimethyl sulfate and

alkali—in contrast to methylation with diazomethane or methanol and hydrogen chloride—causes a decrease in the yield of vanillin of up to 90% in the case of unsulfonated lignin. Methylated lignosulfonic acids, on the other hand, give vanillin yields which are only 20-30% lower than those obtained from the original material. This effect is probably caused by the inhibition of alkaline splitting of the phenolic ether linkages in lignin which results from the methylation of benzyl alcoholic and phenolic hydroxyl groups. This viewpoint is supported by studies of suitable benzyl methyl ethers which yield almost no vanillin on nitrobenzene oxidation. 4 tables, 1 figure, and 12 references. E.S.

LINDGREN, BENGT O., and SAEDÉN, ULLA. On the existence of α-glycol groups in lignin. Acta. Chem. Scand. 6, no. 6: 963-5 (1952). [In English]

When calcium lignosulfonate is treated with sodium periodate at pH 3.5 no formaldehyde is formed; at pH 6-7 about one molecule of formaldehyde per 100 methoxyl groups is obtained. Treating a tosylated lignosulfonic acid (9.08% sulfur content) with sodium iodide in acetone gives one molecule of iodine per 20 methoxyl groups. These results indicate that lignosulfonic acid contains only a very small amount of terminal α-glycol groups. 11 references. F.E.B.

MACHINERY—BOARD MACHINES

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. *Paper Making (Cylinder) Committee.* Papermaking (cylinder). Tappi 35, no. 12: 116-27A (December, 1952).

The text of a meeting and discussion held by the committee during the annual meeting in New York on February 20, 1952 under the chairmanship of J. J. Harrison is presented. E.S.

MACHINERY—CONVERTING MACHINERY

PROUT, JOHN. Efficient carton stitching. Modern Packaging 26, no. 4: 126-7 (December, 1952).

The difference between good and bad carton stitching is described and illustrated, and operating principles are examined for uniform wire draw, sharp cutoff, equal leg length, proper clincher alignment, and sufficient compression. Maintenance measures to correct stitching failure are suggested, and the proper placement of stitches for the various sizes and shapes of containers is illustrated. 1 table and 2 figures. L.C.

ROGERS, B. B. Advantages of the Howard Smith board creaser. Pulp Paper Mag. Can. 53, no. 12: 120-2 (November, 1952).

The instrument, its mode of operation, and the results obtained with it for predicting the creasing properties of board are described. 3 figures. E.S.

MACHINERY—CUTTERS

RODVIL, SOCIÉTÉ ANONYME. The introduction of a metallic reglet for trimmers into France. Rev. papiers et cartons 15, no. 19: 11-12 (Oct. 1, 1952). [In French]

A reglet of a specially heat-treated alloy is suggested in place of the

less durable wooden reglets (a Swiss invention, called reglet Rodvil) and its advantages for paper cutters and trimmers are outlined. E.S.

WEYL, PAUL. The operation of high-speed cutters. Allgem. Papier-Rundschau no. 21: 951-2 (Nov. 12, 1952). [In German]

This is a section of a polemic printed in the *Schweizerische Buchdruckerzeitung*. Following a brief outline of certain principles of cutter operation, the author discusses the limitations of heavy and light cutter constructions, their suitability for soft paper and harder specimens (glassine, parchment, cellophane, abrasive papers, and hardboards), tolerances in the permissible accuracy of cut, and the influence of weight and construction of the machinery on output and quality. E.S.

MACHINERY—DRIVE, ELECTRIC

WEESNER, R. J. Electrical adjustable speed drives in the pulp and paper industry. Southern Pulp Paper Manuf. 15, no. 12: 52, 54, 56-7 (December, 1952); Paper Mill News 75, no. 49: 75-6, 78, 80, 82 (Dec. 6, 1952).

The author describes the six major types of adjustable speed drives available to the industry in the order of cost: (1) wound rotor motors, (2) d.c. motors, (3) eddy-current clutch motors, (4) brush-shifting, adjustable-speed a.c. motors, (5) adjustable voltage drive, and (6) electronic adjustable speed drive. With the exception of (2), all are operated from an a.c. power line. The correct selection for a given purpose is discussed, with special emphasis on the fact that it is unwise to power a machine with a more expensive and elaborate drive than needed. 6 figures. E.S.

MACHINERY—FILTERS

SILVERMAN, LESLIE, and FIRST, MELVIN W. Edge and variable compression filters for aerosols. Ind. Eng. Chem. 44, no. 11: 2777-83 (November, 1952).

Edge filtration is a method used principally in separating particulate materials from liquids. The application of the principle to air cleaning was indicated many years ago; however, practical applications to mine dust in air were only recently attempted. The most important features of edge filters for air and gas cleaning are the high efficiencies which can be obtained and the ability to regulate resistance without a significant change in performance. In the present study, several media (felt, rayon-floc paper, and glass fibers) have been investigated with a number of solid and liquid aerosols of different sizes and characteristics. A small unit handling up to 50 cu. ft. of air per minute at resistances as high as 20 in. of water was constructed, as well as a large pilot unit handling up to 1000 cu. ft. of air for full-scale performance in possible field application. The results from both units are discussed. The design of various configurations indicates their potential application to filtration problems where small-space considerations are paramount. Studies with felted media indicate efficiencies approaching 100%. Fiberglas and plastic fibers may also be used in variable-compression type filters and, although not true edge filters, they can be operated at variable density in the same construction to give a greater range of resistance regulation than felted media. 2 tables, 8 figures, and 14 references. E.S.

MACHINERY—PACKAGING MACHINERY

ANON. Vapor-proof packages of moth repellent are speedily wrapped on versatile machine. Chem. Processing 15, no. 12: 116-8 (December, 1952).

The Enoz Packaged Goods Div. of the Diversey Corp., Chicago employs a Corley-Miller Model MPS wrapping machine to package cakes of moth repellent in cellophane. The machine handles cakes of various sizes and makes packages of a varying number of units using Du Pont 300 MST 54 and 450 MST 54 Cellophane. The vaporproof packages are sealed longitudinally with glue and horizontally with heat. The wrapped cake is enclosed in a light cardboard box. The dimensions and speed of the machine are given, and its operation is described. 2 illustrations. L.C.

B. H. BUNN Co., *Chicago.* Tyers promise automatic bundling. Fibre Containers 37, no. 11: 82, 84-5 (November, 1952).

This company has developed a tying machine for bundling corrugated boxes and folding cartons. The tyer makes two ties simultaneously, with no adjustment required except for the distance between ties; it uses heavy cotton twine instead of sisal or jute. Savings are contemplated in its use as compared with hand bundle-tying methods. 5 illustrations. L.C.

MACHINERY—PASTING MACHINE

WELLBROCK, RICHARD. The machinery manufacturer's views on adhesion. Am. Boxmaker 41, no. 12: 20-1 (December, 1952); Am. Paper Converter 26, no. 12: 14-15 (December, 1952).

Some packaging machines require the adhesive to do two jobs: in addition to sticking, the glue is supposed to perform certain mechanical functions (hold the label in position until pressure is applied, pull the label out of a hopper, etc.). These mechanical forces depend at any given moment on the nature of the raw materials used in the adhesive and the rate with which evaporation converts the glue mix from a wet machineable solution to a dry bonding layer as the machine takes it through several zones. The timing with which the glue enters and leaves these zones must occur in proper relation to the corresponding mechanical actions of the machine, i.e, the drying cycle of the glue mix and the timing cycle of the machine must be in phase with each other. Where they are not in phase, either the machine speed must be varied by making the necessary adjustments, or the glue cycle must be advanced or retarded by the proper amount of dilution. The application of these principles to the operation of the machinery is discussed, as well as the problems which are involved. 8 figures. E.S.

MACHINERY—PIPING

DURST, RICHARD E., CHASE, ANDREW J., and JENNESS, LYLE C. An analysis of data on stock flow in pipes. Tappi 35, no. 12: 529-35 (December, 1952).

A mathematical analysis of the Brecht and Heller, Forrest and Grierson, and Cameron data on head loss caused by pipe friction in transporting pulp-stock suspensions has been made. The proposed correlation, based on the Brecht and Heller data for unbleached sulfite pulp, used a plot of friction factor *versus* a pseudo-Reynolds number defined by the equation: $\Delta H_f D/v^2 L = f = \Phi(D^{0.3} u_Q / C^{1.15})$. This relationship holds for these data with ±7% for all consistencies, and for velocities below a value in feet per second equal to the consistency in per cent raised to the 1.2 power. The head-loss variation resulting from the type of stock may be predicted by correcting the calculated head loss for unbleached sulfite by the factors: bleached sulfite 0.88, unbleached straw 0.45, bleached straw 0.90, groundwood 1.42, steamed groundwood 1.0, and sulfate 0.90. Based on the Brecht and Heller correlation, the Forrest and Grierson and Cameron data appear as curves paralleling the Brecht and Heller curve on the friction factor plot. Using these curves, the

data of Forrest and Grierson and Cameron may be predicted within the limits of ±25 and ±50%, respectively. The Brecht and Heller data relating freeness to head loss showed that freeness has less effect than the deviation of ±7% in the proposed correlation. A correction for freeness, therefore, does not seem feasible at this time; temperature, within the range of 18 to 35°C., does not affect the head loss beyond the accuracy of the correlation. 3 tables, 11 figures, and 11 references. E.S.

MACHINERY—PUMPS

FORREST, F. R. Accumulation of safety factors in centrifugal pump applications. Paper Trade J. 135, no. 26: 31-2 (Dec. 26, 1952).

The accumulation of safety factors taken when a centrifugal pump is purchased can often result in overrating, a condition which causes excessive power consumption and undue abrasive action from improper flow. The way in which safety factors are accumulated during pump design and manufacture is explained, and the method for checking the efficiency of the pump after installation is described. 1 chart. L.C.

KARASSIK, IGOR J., and CARTER, ROY. Centrifugal pumps . . . Paper Ind. 33, no. 10: 1194-7; no. 12: 1430-2 (January, March, 1952); 34, no. 2: 210-12; no. 5: 602-5; no. 8: 983-6 (May, August, November, 1952); *cf.* B.I.P.C. 22: 337.

Continuing the series of articles on centrifugal pumps, the 1952 installments include the following subjects: Characteristic curves and pump relationships, p. 1194-7 (January, 1952); Factors involved in selecting pump drivers, p. 1430-2 (March, 1952); Selection of electric motors for centrifugal pump drive, p. 210-12, 602-5 (May, August, 1952); Pump control, p. 983-6 (November, 1952). Numerous illustrations are included in the text; additional installments will be published in 1953. E.S.

MACHINERY—ROLLS

MACKLEM, WARREN W. Crownless press rolls. Paper Trade J. 135, no. 23: 17-18 (Dec. 5, 1952); Southern Pulp Paper Manuf. 16, no. 1: 44, 46 (January, 1953).

The basic construction of a crownless press roll developed by the Black-Clawson Co. is described. It consists of a heavy cast cylindrical shell of ductile iron shrunk onto a heavy cast core. The shell is divided into three beam sections: a simple beam in the center and a cantilever section at each end with no contact between the core and the ends of the cantilever sections. Crownless rolls installed to date have shown excellent operating results. 5 figures. E.S.

MACHINERY—VORTEX-TYPE DIRT SEPARATOR

TOMLINSON, G. H., II, and TUCK, N. G. M. The use of the Centricleaner with special reference to the cleaning of alkaline hardwood pulp. Pulp Paper Mag. Can. 53, no. 12: 109-14 (November, 1952); *cf.* B.I.P.C. 22: 750.

This is an interim report on the results obtained with the Centri-Cleaner (I) (a free-vortex-type centrifugal separator) in the soda pulp mill of Howard Smith Paper Mills Ltd., at Cornwall, where unbarked mixed hardwoods are used as the raw material. The factors which led to this particular

development, the construction and mode of operation of (I) (*cf.* B.I.P.C. 23: 185), and the installation of the units before and after the bleaching stage are described. Operating data with the 850-g.p.m. unit are given with which extensive mill experience has been accumulated since June 1951. The results indicate that pulp of exceptional cleanliness can be obtained with unbarked wood when the alkaline process is used. However, laboratory investigations with other types of pulp have indicated that the device can be applied successfully to a number of stocks; smaller and larger units than the one described here may be constructed, as required. 4 tables, 6 figures, and 2 references. E.S.

MATERIALS HANDLING

ANON. Materials handling, an important operating problem! Allgem. Papier-Rundschau no. 13: 597-8 (July 12, 1952). [In German] *cf.* B.I.P.C. 22: 673.

Different mechanized materials-handling machines built by the German firm Steinbock GmbH. are described, including a lift truck for the handling of paper rolls. 4 illustrations. E.S.

WILCOX, DONALD B. Economic aspects of material handling. Southern Pulp Paper Manuf. 15, no. 12: 66, 70 (December, 1952); *cf.* B.I.P.C. 22: 754.

The possibilities of materials handling in plants are discussed as the outstanding activity holding the greatest potential opportunities for savings. The factors which should receive consideration are outlined. E.S.

METERS AND RECORDERS

TUCKER, M. J. Effect of pen-to-paper friction in recording instruments. Electronic Eng. 23, no. 276: 61-3 (February, 1951); J. Textile Inst. 42, no. 7/8: A337 (July/August, 1951). [Abstract only available]

The results are presented of an investigation of the effect of friction between the pen and the moving chart paper on measurements recorded by automatic instruments. The determination of the static friction constant is considered and two methods are indicated. An equation for calculating the error at any point on a recording is derived, and an appropriate solution for the general use of a driving force is given. E.S.

MILL CONTROL

FERRIER, J. A. Maintenance control at Spruce Falls Power & Paper Co. Ltd. Pulp Paper Mag. Can. 53, no. 12: 115-19 (November, 1952).

The maintenance program at Spruce Falls is cited as an example of successful control which emphasizes administration, planning, and engineering. Cost control, planning, methods of planned maintenance, and maintenance engineering are discussed under those headings. 9 illustrations of maintenance and cost-accounting forms. L.C.

MILL MANAGEMENT

EATON, KENNETH J., and ROSE, S. E. Operation: bottle-neck. Am. Boxmaker 41, no. 12: 16, 18-19 (December, 1952).

A paper converter found it possible to increase output 30% and decrease

unit-labor costs by 25% in the Box Division without capital investment for equipment. Management consultants, conducting time and motion studies and studies of order scheduling, found ways to improve plant productivity by an increased utilization of existent equipment, floor space, inventory investment, and personnel. The various equipment shifts, time-saving methods, and personnel arrangements are described. 4 figures. L.C.

FAIR, ERNEST W. Ten steps to better employee relations. Paper Ind. 34, no. 9: 1120 (December, 1952).

Useful directions for handling employee grievances are given. E.S.

LEVESS & ELLIOTT. *Methods Department.* The cost impact of employee communications. Am. Boxmaker 41, no. 12: 27-9 (December, 1952).

Two-way communications between employee and management aid in setting up a mutually satisfactory labor-relations situation. Happy informed employees co-operate with management to avoid material waste and product spoilage, handle materials neatly and thoughtfully, work with vigor, care for their tools and equipment, and make constructive suggestions for savings in work-time and effort. Eight steps in management's process for bringing about optimum conditions in these areas are described. The cost of starting a working program of employee communication is more than compensated for by the large savings it creates. 2 illustrations of individual employee records. L.C.

PACKAGING

ANON. Boxes from Gardner, bags from Sorg, yet retailer has his packaging family. Packaging Parade 20, no. 239: 100-1 (December, 1952).

Employing outside research counsel and artists to supply their basic designs, The Gardner Board & Carton Co. and the Sorg Paper Co. are combining efforts to produce a family of unified packages for retail use. Merchants will be able to adopt a basic design and color to suit their own taste and to carry this style throughout their packaging supplies, whether boxes, bags, or wrapping paper. Full-scale production by both companies is planned to begin January 1. The Miami Valley Paper Shippers Association will handle the combination orders. 4 illustrations. L.C.

ANON. Full quart of milk in a 3.5 ounce package. Packaging Parade 20, no. 239: 49 (December, 1952).

Sanna Dairies, Madison, Wis. is marketing 3.5-ounce pouches of nonfat dry milk solids which yield a full quart of milk when mixed with water. The perfectly moisture-proof, flexible package is made of Metalam (a product of the Dobeckum Co., Cleveland, Ohio), a laminated combination of aluminum foil, paper, and polyethylene film. 2 illustrations. L.C.

ANON. Packaged poultry. Paper Box Bag Maker: 200-1 (November, 1952).

Custom, transportation problems, and cost are some of the main obstacles to the development of a packaged-poultry trade in England but, nevertheless, because of good response to experimental selling along these lines, it is felt that good-quality birds in attractive protective packages would have an appeal

for sale by mail. Small suppliers are currently wrapping frozen birds in polythene bags and fresh poultry in four feet of fine paper, then in strong kraft, and finally in a plain brown board box sealed with plastic tape. The birds remain in good condition if delivered promptly by the postal department; there is a need for the development of low-cost boxes especially designed for this purpose. L.C.

ANON. The technical evolution in packaging. Rev. papiers et cartons 15, no. 20: 11-13 (Oct. 15, 1952). [In French]

Reference is made to recent developments in packaging, including the application of new plastic films (cellophane, cellulose acetate, Pliofilm, saran, polyethylene), kraft-laminated papers, and aluminum foils, corrugated shipping containers, and the use of paper-milk bottles. E.S.

BAKER, EDGAR D. S., and WINFIELD, J. L. Engineering a package—the fundamentals of design and mechanisation. J. Inst. Packaging 2, no. 16: 128-32 (2nd quarter, 1952).

Under the title "Functional design," Winfield gives the steps in defining a problem in package design. He also lists the basic fundamentals to which a good package must conform and describes the stages through which a designer must take his idea before presenting it to management for acceptance. Baker discusses "Production of the pack," the engineer's practical application of the package designer's idea, taking into account the cost factor, the production layout, and the standards of material quality. The reasons for and against changing an existing pack are given. A successful co-operative project is presented as an example of the reciprocal advantages of a designer-engineer partnership which are stressed in both papers. 5 figures. L.C.

FOOD ENGINEERING. Prepackaging is fanning out. Food Eng. 24, no. 12: 112-14 (December, 1952).

Meat packers are beginning to do more prepackaging; new and better machines have made this possible. The Peters Sausage Co. in Detroit uses a Corley-Miller sheeter and wrapper for packaging sliced luncheon meats, wieners, and sausages at the rate of 2100 packages per hour. Bacon is also partially processed on this machine, as well as on an Anco hydraulic bacon press and a Hydramatic slicer. Ten-ounce portions of sandwich spreads are stuffed into Saran tubing by a conventional stuffing machine with a Rockford volumetric filler attachment. The labor-saving aspects of the machinery and techniques are described. 4 illustrations. L.C.

HAWTHORN-MELLODY FARMS DAIRY, *Chicago.* No melting point for this super market ice cream pack. Packaging Parade 20, no. 239: 54-5, 57 (December, 1952).

This company is marketing pints of ice cream in an insulated carton which adds a cost of 16 cents to each gallon, but which has received acclaim in supermarket distribution where ordinary packaging allows ice cream to melt between refrigerator and checker. The regular pint carton is filled, its contents hardened, the pint enclosed by a Clybourn unit in a corrugated sleeve, and the whole overwrapped by a Hayssen unit with printed waxed paper. Eight pints are placed together in a kraft bag. A pressure-sensitive seal secures the corrugated sleeve, and the waxed paper layer is heat sealed. The equipment used for handling the pints runs as a continuous line; the setup is described. 13 illustrations. L.C.

HAYHURST, L. J. Research on flexible films for food packaging. Food Tech. 6, no. 12: 454-5 (December, 1952).

The author gives a check-list of factors which packaging engineers must consider when developing flexible films for food packaging. He illustrates these research considerations by tracing the development of a suitable film for process cheese. The wrapper in use at present is cellophane with a thermoplastic coating; it is a dimensionally stable, heat-sealable, moistureproof, and essentially gasproof wrapper that shows an affinity for the product and is grease resistant, odorless, tasteless, and sufficiently strong to carry the weight of the product. Cellophane, Pliofilm, polyethylene, saran, acetate, and foil, combined in various ways and coated with various materials, offer unlimited possibilities to food packagers. L.C.

HOLLICK, S. H. The African market. J. Inst. Packaging 2, no. 15: 97-8, 103 (1st quarter, 1952).

The African continent offers a market worth developing for the future, and with its development it brings challenges to packagers. Packages must be able to meet the rigors of six-month delays from the port of discharge to the ultimate destination, extremes of wet and dry atmosphere, transportation over "corrugated" roads, and handling by illiterate African labor to whom "Glass—Handle with care" has no meaning. In addition to the physical or security side of packaging which maintains sales, the author describes the complications of the psychological or presentation side of packaging. He discusses the language differences and the psychological make-up and customs of the European, the Afrikaner, and the native who live side-by-side. Suggestions for meeting some of these problems are given. L.C.

MCGILL, J. S. An objective approach to packaging. J. Inst. Packaging 2, no. 16: 125-7 (2nd quarter, 1952).

An objective approach to packaging problems involves the necessary knowledge of the mechanical properties of the article to be packed in order to supply adequate shock protection for it, of the strains and stresses to which the package will be subjected, and of the shock resistance, recovery factors, cost, and application of various packaging materials. A testing laboratory for drop, incline, and vibration tests in the shipper's plant is essential. In addition, transit tests are necessary. Examples of some of the various cushioning materials which are especially suitable for the packaging of electrical equipment are: Hairlok, a rubberized product using latex-covered hair and/or fiber; Resil, a type of molding obtained by the treatment of sawdust and synthetic resin in a water medium; and expanded P.V.C. (polyvinyl chloride) in sheet or block form in thicknesses up to three inches. Fewer protective measures are required for shipments via air freight, since stowage is carefully done; although the freight cost is high, the reduction in packaging costs make air shipping practical. 3 illustrations. L.C.

PACKAGING PARADE. Fudge packaged in liquid form. Packaging Parade 20, no. 239: 52-3 (December, 1952).

A "Transwrap" unit is used to fill two-ounce flexible packages with liquid chocolate fudge. Two rolls of a double-width film of treated 300 cellophane laminated to 0.002 polyethylene are led in and formed around a fin-seal tube, the side seals are formed, the product filling takes place, and a "flying" knife separates the top and bottom pouches and seals them simultaneously. Twenty-four such packages are placed in a glued infold Beers-style carton and then in a corrugated box for shipment. The process from liquid fudge to final

carton is described. Packaging Promotions Sales Corp. packages the fudge for the Robert A. Johnston Co. 7 illustrations. L.C.

RIDDELL, G. L. R. Problems of packaging. Paper Making and Paper Selling 71, no. 3: 28-31 (Autumn, 1952).

Three main factors are involved in every packaging problem: cost, protection to the contents of the package, and appearance. The author describes some of the tests which are applied in the laboratories of PATRA to achieve the most satisfactory conditions for the safe storage and transit of goods. 3 figures. L.C.

PAPER—SHEET FORMATION

TUTT, RICHARD, JR. Animal glues provide economy and facilitate papermaking. Paper Ind. 34, no. 9: 1115-16 (December, 1952).

The author discusses the use of the coagulating, agglomerating, or flocculating effect of chemically modified animal glue solutions applied to papermaking materials, with particular reference to the U. S. patent 1,622,474 granted to Karl Sveen in 1927 for improving sheet formation and retention in the web. Another well-known application is in the separation, recovery, and clarification of the white water in mechanical savealls. A study by the author of the most suitable glues for the first-named purpose showed that hide-stock glues of high protein value of approximately 225 grams jelly strength gave the best results over the widest range of pigments and machine pH conditions. At the time of these tests, the only known formulation for preparing these dilute glue solutions called for the use of aluminum sulfate or papermakers' alum (I) for activation. The author and co-workers discovered in 1944 that chromic potassium sulfate (chrom alum) provided improved colloidal activity to hide-glue solutions; lesser amounts and a shorter aging period were required than with (I). The invention is covered by U. S. patent 2,403,144 (July 2, 1946). E.S.

PAPER AND PULP INDUSTRY

NEUBRECH, W. LEROY. Reviews the economy of the pulp, paper and board industries. Paper Trade J. 135, no. 24: 21-2, 26, 28, 30, 32 (Dec. 12, 1952); Southern Pulp Paper Manuf. 16, no. 1: 26, 28, 32, 36, 38 (January, 1953).

This article is a reprint of the complete text of the U. S. Department of Commerce Pulp, Paper and Board Industry Report 8, no. 4 (December, 1952), but includes only two of the 16 tables of the original and none of the graphs. L.C.

POULIOT, L. J. The billion dollar industry. Pulp Paper Mag. Can. 53, no. 13: 76-86 (December, 1952); *cf.* B.I.P.C. 22: 421-2.

The pulp and paper industry in Canada reached a new record in 1951 with a gross output of $1,237,897,470. This is a rise of 29.7% over the 1950 record. The net value of the output, $679,257,743, is an increase of 32.9% over 1950. Pulp production reached 9,314,849 tons and paper and paperboard production attained 7,225,271 tons, respective volume increases of 9.9% and 6.1%. Pulpwood output (15,053,910 rough cords) showed increases of 16.9% in volume and 33.6% in value. During 1951, 126 mills were in operation, three more than in 1950. Increases in wood-pulp exports amounted to 21.5% in quantity and 75.1% in value, and the total value of paper and paper goods

exported in 1951 showed an increase of 13.6% over 1950. Newsprint paper represented 93.4% of this value. This is the twelfth consecutive year of increases in this industry, which ranks first among Canada's industries in gross and net values, salaries and wages, and second in employment. In addition to statistics on the above aspects of the 1951 picture, volume and value figures are presented for pulp, paper, and pulpwood productions as a whole and by kinds, for materials used, equipment and capacity, electricity and fuel consumed, and wage and salary distribution. 16 tables and 5 figures. L.C.

PAPER AND PULP INDUSTRY—LAWS AND LEGISLATION

FOWLER, R. M. Mr. Fowler protests; Minister of Justice answers. Paper Trade J. 135, no. 23: 20, 22 (Dec. 5, 1952).

On behalf of seven fine paper mills named in the report by Canada's Combines Commissioner, the author protests to Canada's Minister of Justice that the report on the industry was presented to the Minister one week before the new anticombines legislation came into effect. He claims that the alleged agreement on prices for fine papers has not been proved a "detriment to the public." The industry's compliance with government directives and its service to the Canadian economy are pointed out. The seven mills concerned are listed. A reply by Minister of Justice Stuart Garson is appended. He defends the action of the Commissioner and states that the courts define substantial elimination of competition as constituting detriment to the public. The author's other arguments await answer pending the possible prosecution of the fine paper industry. L.C.

PAPER AND PULP MILLS

ANON. Sorg expands converting dept.; increases specialization. Paper Ind. 34, no. 9: 1085-6, 1089 (December, 1952).

Some of the new commercial converting machinery (a two-color aniline and a two-color gravure press, a plastic coating and film-casting machine, a bag machine, and a Cameron rewinder) and experimental equipment (a pilot coating machine and a laminator) are described briefly. New offices and laboratories have also been installed by the Sorg Paper Co. at its Middletown, Ohio mill. 6 illustrations. E.S.

DELEON, MARCEL. The mission of European industrialists to the United States. Rev. papiers et cartons 15, no. 19: 3-5; no. 20: 3-6 (Oct. 1, 15, 1952). [In French]

As a member of one of the French productivity teams for the pulp and paper industry, the author records his impressions of his trip to pulp and paper mills in Ohio, North Carolina, and California, lists the reasons for the high productivity in America, and discusses the possible application of some of his observations to French mills. E.S.

DYCK, A. W. J. Moraine—America's most modern fine-paper mill. Paper Ind. 34, no. 9: 1106-9 (December, 1952); *cf.* B.I.P.C. 18: 690.

The installations of the 90-ton fine-paper mill at West Carrolton, Ohio are described. The output includes envelope paper, offset paper, sulfite ledger, index bristol, and cream postcard stock. The straight-flowsheet operational design of the windowless mill on one floor, efficient lighting and air conditioning, the use of mechanized equipment, and the exclusive use of Hydrafiners and jordans for the stock preparation of virgin pulps and of a Hydrapulper

for deinking waste paper contribute to the high output of the mill with a very low man-hour usage per ton of paper. 9 illustrations of the mill and its equipment. E.S.

EVANS, JOHN C. W. Fine paper manufacture in Canada. Pulp Paper Mag. Can. 53, no. 12: 100-4 (November, 1952).

Nearly 150 years ago (1805), Canada's first mill was started for the production of writing and printing papers. Since then the manufacture of fine papers has become one of the country's largest industries; during the past 12 years alone, its tonnage has increased by 90%. Today, seven producers operate 14 mills which manufacture 500 kinds of paper, primarily for domestic consumption. The details of the industry's historical background and a brief description of the seven companies are given. 1 table, 6 figures, and 7 illustrations of watermarks. L.C.

LAQUEUR, V. Uruguay's Fabrica Nacional, S.A. Pulp & Paper 26, no. 13: 79, 81 (December, 1952).

Following a brief history of the company, the new modern paper mill on the Rio de la Plata, near Montevideo and its installations are described. The design and layout of the entire new mill housing the No. 3 paper machine were by Sandy Hill Iron & Brass Works, which supplied all equipment. The mill makes fine paper from bleached straw. 9 illustrations of the equipment. E.S.

PULP & PAPER. Detroit Sulphite Pulp & Paper Co.; mill in a great city. Pulp & Paper 26, no. 13: 36-8, 40, 42, 44, 46 (December, 1952).

A profusely illustrated description of the different departments of the mill on the River Rouge within Detroit's city limits is given, including the wood yard, the pulp mill with eight Mitscherlich digesters, and the paper mill with six machines, of which two are new Yankee Fourdrinier machines. The mill makes 150 tons of light-weight sulfite specialties (more than 200 different grades) per day, including all kinds of waxing grades, box-cover and creping papers, tissues and carbonizing papers, and coated paper. 1 map and 28 illustrations of the mill and equipment. E.S.

PAPER SPECIALTIES

ANON. Foil liner for lettuce. Modern Packaging 26, no. 4: 130-2 (December, 1952).

A crate liner of aluminum foil backed by wet-strength kraft paper has proved effective for wet- or dry-pack handling of lettuce. The foil affords greater protection than does the standard paper liner because of its reflective and conductive properties, its imperviousness to light, and its moistureproof characteristics. The kraft backing permits the use of a thinner, less expensive foil, and makes the sheets stronger and easier to separate. Both the wet- and dry-pack methods are described. Experiments with broccoli and celery indicate the possible use of the laminated-foil liner for these perishables. 8 illustrations. L.C.

ANON. How VCI cuts costs. Modern Packaging 26, no. 4: 114-17, 205 (December, 1952).

Paper saturated with volatile corrosion inhibitor (VCI) has been successfully used by the Electro-Motive Div. of General Motors Corp. for rust

prevention in the packing of precision replacement parts for Diesel engines. Also called "vapor-phase inhibitors," the chemicals include sodium nitrite urea, dicyclohexylammonium nitrite, and similarly performing compounds. The company uses VCI papers as a direct wrapping for the parts or in crumpled wads at several points within the package in 98% of its shipments. Laboratory tests and commercial use have shown the new method to be a more effective rust inhibitor than the dipping compounds and grease coatings formerly used; the cleaning of parts after delivery is eliminated. A saving of $100,000 per year on packaging has been made. 11 illustrations. L.C.

ANON. It sticks but isn't sticky. Monsanto Mag. 31, no. 5: 20-1 (December, 1952-January, 1953); *cf.* B.I.P.C. 22: 126.

The Nashua Corp. has developed a heat-seal adhesive which consists essentially of a solid plasticizer dispersed in a resin. The adhesive is nontacky before heat application, but remains sticky after heating until pressure is applied; it is used for label papers sold under the trade name "Pervenac." Three types are available: Pervenac BM-1 for labeling smooth-surface containers; Pervenac CL for labeling cellophane-wrapped goods; and Pervenac WP-1 (which can withstand long immersion in water) for labeling frozen prepackaged meats. Pervenac papers are not subject to blocking and can be printed on either side. A similar series of heat-seal papers (Imac) is manufactured for heat-pressure application, such as saddleback labels on potato-chip bags. Special automatic machinery had to be developed for the process. 3 illustrations. L.C.

ANON. Nox-Rust vapor wrapper. Rev. papiers et cartons 15, no. 22: 9-10 (Nov. 15, 1952). [In French] *cf.* B.I.P.C. 19: 311.

French paper mills have been licensed by the Nox-Rust Chemical Corp. in Chicago to manufacture Nox-Rust wrapping paper, a neutral kraft paper treated with a synthetic chemical (Callex); the slow vaporization of this chemical exerts a protective action on iron and steel objects wrapped in it. 2 illustrations. E.S.

ANON. A throw-away filter medium. Can. Chem. Processing 36, no. 13: 50, 52 (December, 1952); *cf.* B.I.P.C. 22: 843.

Du Pont neoprene-treated paper is marketed in Canada by Canadian Industries Limited; the Provincial Paper Company is currently testing it as a disposable filter medium in its operations. Essentially the same information is given as in the previous reference with regard to the physical and chemical properties of this paper, which may be used in combination with, or as a replacement for, cotton duck. 1 table. L.C.

ASSOCIATED BRANDS, INC., *Brooklyn, N. Y.* Decals automatically applied. Modern Packaging 26, no. 4: 101-3, 207 (December, 1952).

This distributor of children's cosmetics is the pioneer user of a paper-backed decalcomania which is transferred to the bottle on a slightly converted standard paper labeler. A special solvent release solution used in the application of the decal allows the paper backing to be peeled, not "slipped" off; the design is a three-color picture which is protected by a lacquer coating. A paper label is applied to the back of the flat bottle by an almost identical machine. This simple operation, replacing the slow costly silk screen method, is discussed, and the labeling machines and conveyor setup are described. 7 illustrations. L.C.

CLABE, J. The use of laminated papers for the manufacture of bags. Rev. papiers et cartons 15, no. 19: 13-14 (Oct. 1, 1952). [In French]

The need for the correct selection of the laminating agent and the two plies used in the manufacture of laminated bags is emphasized; the article deals particularly with applications of greaseproof or glassine paper as the inner ply. 1 table. E.S.

CUSACK, WALTER T. Specialty papers. Tappi 35, no. 12: 104-6A (December, 1952).

The author gives examples to illustrate the trials, errors, and delays involved in the research for bringing out new paper specialties. Particular reference is made to the development of a paper for a disposable vacuum-cleaner bag. E.S.

DANGON, GEORGES. The manufacture of drawing paper. Papetier 6, no. 11: 30, 32 (November, 1952). [In French]

A brief general outline of the different types of French drawing papers used by artists (water-color work), architects, draftsmen, and schools is given, including furnish, sizing, finish, and sizes and weights. E.S.

KOTTE [HANS] Polyvinyl alcohol and polyvinyl acetate in the paper industry. Allgem. Papier-Rundschau no. 22: 990-1 (Nov. 26, 1952). [In German]

Polyvinyl alcohol and polyvinyl acetate have been used for about 10 years as coating adhesives in the manufacture of book and magazine papers; recently, they have also been employed for the preparation of greaseproof and water-vaporproof specialty papers. In the board industry they find application as sizing and laminating agents. Mixtures with other ingredients (starch, dextrin, casein, gelatin, and urea-, melamine-, and phenol-formaldehyde products), methods of application, and the improved properties of the treated papers and boards are described briefly. E.S.

KOTTE [HANS] Printing paper with "double volume." Allgem. Papier-Rundschau no. 13: 592 (July 12, 1952). [In German]

Evidence is presented that the term "double volume" occasionally used in the German paper trade in connection with bulking book or featherweight paper does not represent a paper with twice the bulk or volume at identical basis weight, that it is therefore misleading, and that its use should be dropped altogether. Many paper jobbers are not even familiar with the expression, although reference is made to it on page 128 of the 1944 edition of Korn and Burgstaller "Papier- und Zellstoff-Prüfung." 1 table. E.S.

MCMILLAN, JOHN H. Conversion of dry-creped facial type tissue. Can. Pulp Paper Ind. 5, no. 12: 8-10, 44 (December, 1952).

The author defines dry-creped tissue as a class of paper with a gauzy texture which is fairly transparent and of a weight lighter than 15 pounds (24 × 36—500). It is commonly manufactured on a Yankee Fourdrinier machine from a furnish of sulfite, sulfate, and groundwood stocks, and dry-creped on the single Yankee drier. The raw-stock requirements—of which uniformity is paramount—are outlined and the principles involved in three specific converting machines (Paper Converting Machinery Co.'s toilet winder and facial

napkin machine, and Hudson Sharp Machinery Co.'s band-saw type napkin machine) making one- and two-ply bathroom tissues, two-ply facial tissues, and two- or three-ply napkins or serviettes at Westminster, B.C. are described. 5 diagrams. E.S.

PAPER SALES. Are you keeping up with new paper cup uses? Paper Sales 12, no. 12: 12-14 (December, 1952).

Hospitals, schools, industrial plants, restaurants, and gasoline service stations are discussed as five good markets for paper cups and containers. The types of items called for by each market are given. 4 illustrations. L.C.

RICHARDSON, HOWARD L. Way to bar gnats from storage tanks. Food Eng. 24, no. 12:11 (December, 1952).

Insects have been kept out of vinegar-storage tanks by the application of kraft wrapping paper to the outer two feet of the tank lids from which the paper extends two feet down from the top of the tank walls; the paper is sealed to the wood tank with masking tape. This sealing method also prevents the escape of odors from the tank. 1 illustration. L.C.

TOBIAS, LAWRENCE S. Development of twisting papers to capture new markets. Tappi 35, no. 12: 102-4A (December, 1952).

The author describes some of the difficulties encountered in the manufacture of twisting or spinning papers, the high demands placed by converters on the uniformity and lack of defects of the product (the slightest defect will invariably cause a break in the dies of the twisting machine), different applications (seat covers, vegetable bags, and rug, spool, and gray cops), and attempts to improve the tensile strength of the twines by incorporating glass fibers. The future of twisting papers may be as bright as the development of the paper milk bottle, if manufacturers are sufficiently alert to capture the existing markets. E.S.

PAPER SPLICING

ANON. The splicing of paper rolls with dry adhesives. Rev. papiers et cartons 15, no. 20: 17-18 (Oct. 15, 1952). [In French]

The splicing of paper by superposition of the two sheets to be united with an adhesive between the overlapping sections or by placing the edges of the sheets flush and uniting them with adhesive tapes with either paper or plastic-film backings by the application of heat and pressure or pressure alone is described. Certain of the dry adhesives (gutta-percha, rubber, vinyl resin, etc.) cause troubles in the regeneration of waste papers. E.S.

PATENTS

WEST, CLARENCE J. United States patents on papermaking, third quarter, 1952. Tappi 35, no. 12: 135-41A (December, 1952); *cf.* B.I.P.C. 23: 117.

An annotated list of U. S. patents for the third quarter of 1952 is presented. E.S.

PHYSICAL TESTING—FASTNESS TO LIGHT

CRAMER, GEORGE. Fade-Ometer testing. Am. Ink Maker 30, no. 12: 30-2, 65 (December, 1952); *cf.* B.I.P.C. 22: 426-7.

Revisions of the proposed Fade-Ometer Test Procedure which have been

recommended since the original test procedure was published by the Packaging Institute are described. To prevent error through back fading, an Eastman Kodak paper which shows no appreciable change when exposed to intense light for several hours has been chosen as the standard base for testing inks. Other revisions and deletions are explained, and the modified procedure is given in entirety. 1 illustration. L.C.

PHYSICAL TESTING—INK

ANON. Details of Sutherland ink rub tester. Am. Boxmaker 41, no. 12: 22-3, 26 (December, 1952); Am. Paper Converter 26, no. 12: 11-13 (December, 1952); *cf.* B.I.P.C. 23: 272.

The tester is a motor-driven device for moving a weighted test specimen over a printed sample through an arc of 2.25 inches for a predetermined number of strokes; a stroke comprises one complete to- and fro-motion of the test weight. Two-pound and four-pound weights are provided, each having four square inches of effective contact area. The following tests may be carried out with the instrument: dry rub, wet rub, wet bleed or transfer, wet smear, and functional rub. The procedures for each test are described briefly. The instrument was developed by Martin Galbraith. 2 illustrations. E.S.

PIHL, L., COUPE, R. R., ESSEX, G. H., and MONROY, J. H. Methods of measuring the drying of inks on paper. Intern. Bull. for the Printing and Allied Trades no. 61: 28-9; discussion: 30 (July, 1952).

Three instruments designed to measure empirically the time of drying of inks on paper are described in the following articles, listed by author and title: Pihl, L. A new ink drying time recorder, p. 28; Coupe, R. R., and Essex, G. H. The Patra 'set-off' drying time apparatus, p. 29; and Monroy, J. H. The I.G.T. drying time recorder, p. 29. On all the instruments, a stylus arrangement or its equivalent applies pressure to printed strips which are fastened to a drum rotating at a different speed in each case. The pressure of the properly weighted stylus records set-off marks on a blank sheet placed over the strips to be tested. The point at which set-off marks no longer occur is registered as the drying time. 2 illustrations in the first article and 1 illustration and 1 reference in the second. L.C.

PHYSICAL TESTING—LIME

THOMAS, R. K. A study of methods for determining the settling rate of hydrated lime slurries. ASTM Bull. no. 184: 50-2 (September, 1952).

The many factors entering into the determination of the rate of settling of a hydrated lime milk or any similar finely divided suspension appear to make very closely reproducibility of results in different laboratories almost impossible. Two methods under consideration for standardization by the American Society for Testing Materials are outlined which differ essentially in the manner in which the original slurry is made up. The first or "Proposed ASTM method" requires slurrying in a large volume of water in the tube actually used for comparison, whereas the second or modified method requires that the sample be first made into a thick putty, using a small amount of water and allowing the putty form to stand before dilution to the proper volume for the test; this was felt to give a more intimate mix of the lime with the water. Either method was found to distinguish clearly between a fast- and slow-setting hydrate; however, checks of rates to close limits are

not possible. The modified method, despite its requirement for more manipulation on the part of the tester, is slightly better and should give results which could be duplicated within reasonable limits in another laboratory. 4 tables and 3 figures. E.S.

PHYSICAL TESTING—PAPER—BURSTING STRENGTH

CARSON, F. T., and WORTHINGTON, VERNON. Diaphragm error and testing rate in the paper bursting test. Tappi 35, no. 12: 539-44 (December, 1952).

The diaphragm error can be virtually eliminated by: (1) selecting rubber-diaphragm material no thicker than is necessary for the range of papers to be tested; (2) bringing the diaphragm as close as practicable to the paper; and (3) installing it with adequate slack. A method of evaluating the diaphragm error is described: the space between diaphragm and paper is filled with liquid; then a very thin film of rubber is laid over the liquid and sealed with grease under the edges. Tests with this arrangement in comparison with normal tests afford a good indication of the diaphragm error. To determine the rate of stressing the paper, the gross rate of the displacing liquid must be supplemented by an "apparatus constant," evaluated in terms of the volume of liquid displaced in the apparatus, exclusive of the volume of the paper dome, through the middle half of the pressure range of the gage used. A height gage useful in the routine assessment of the diaphragm installation, and an air trap, useful in deairing gages, are described and illustrated. 4 tables, 3 figures, and 4 references. E.S.

FAICHNEY, L. M., and MASON, S. G. The bursting strength of paper: recommended test method. Pulp Paper Mag. Can. 53, no. 12: 123-6 (November, 1952); *cf.* B.I.P.C. 19: 574-5.

A number of modifications to the existing TAPPI Standard T 403 m-47 (bursting strength of paper) are suggested, including removal of entrapped air, pumping rate, gage extensibility, conditions of clamping, etc. These will form the basis for Canadian Standard D-8. The full text in its present form is published for the purpose of soliciting comments and criticisms. 3 tables, 2 figures, and 8 references. E.S.

PHYSICAL TESTING—PAPER—ERASURE TEST

AMERICAN SOCIETY FOR TESTING MATERIALS. *Committee D-6 on Paper and Paper Products. Subcommittee I on Paper Testing Methods.* Proposed method of test for erasing quality of paper. ASTM Bull. no. 185: 24-5 (October, 1952).

This proposed method is published to solicit comments preliminary to further consideration for adoption by the Society. It is based on the controlled abrading procedure of Codwise (*cf.* B.I.P.C. 15: 248-9) and employs the rubbing action of an abrasive cloth under standardized conditions in a mechanical abrading apparatus. It is applicable to various types of paper surfaces and, although the method covers the erasure of standardized ink markings, the principle can be employed to advantage for all types of erasure work. This is similar to TAPPI suggested method T 478 sm-50. 1 figure and 5 references. E.S.

PHYSICAL TESTING—PAPER—GLOSS

HUNTER, RICHARD S. Gloss evaluation of materials. ASTM Bull. no. 186: 48-55 (December, 1952).

The author discusses the reasons for the present growth of a variety of gloss-testing procedures. The geometric reflectances of different object surfaces vary greatly from one to another, and the corresponding appearance features used for visual ratings of gloss differ greatly. No single gloss-measurement procedure will ever serve all the needs of the different materials. As a consequence, different gloss scales involving different geometric aspects of light reflectance have been developed. Each provides numbers correlating with the glossy appearance of the specific types of surfaces to which it is applicable. The effective co-ordination of the needs of different technologies might reduce slightly the present number of established gloss-testing procedures. For certain types of glossy appearance, however, correlating methods of reflectance measurement do not exist, and new gloss-testing procedures are needed for these criteria which can at present not be measured. The trend will therefore be toward more, rather than fewer, of these procedures. To corroborate his reasoning, six established methods of gloss measurement, their major applications (paints, plastics, uncoated and glossy papers, sheen, and porcelain and high-gloss enamels), and important values are described, and the results are presented in tabular form. This is supplemented by a graph which illustrates roughly the differences between the gloss values of five of the six scales. 3 tables, 12 figures, and 22 references. E.S.

PHYSICAL TESTING—PAPER—OIL PENETRATION

CARLSSON, G. E., and PIHL, L. Physical aspects. Some studies on the penetration of viscous oils into porous paper. Intern. Bull. for the Printing and Allied Trades no. 61: 16-21; discussion: 25-7 (July, 1952).

Two experimental methods which have been used to observe mineral oil penetration on newsprints are the Lucas-Washburn test for the height of rise of fluid in paper, and the oil-flotation test of Larocque (*cf.* B.I.P.C. 7: 236). The conclusion reached by the authors on the first method was that oil viscosity and especially fiber orientation have an extremely great influence on the rate of rise of the oil in the paper, this being greatest when the paper strip is in the machine direction. The oil-flotation number is influenced by the viscosity and the surface tension of the oil as well as by the paper caliper squared. The height of rise in newsprint as compared with filter paper was found to vary very little in comparison with the differences between them which were shown by the determination of their oil-flotation numbers. Since it is quite time consuming to determine the height of rise and since the differences detected by this test are so small, the test does not seem to be of interest or value. The oil-flotation test is of value if the oil-flotation number is corrected with reference to the paper caliper. 10 tables and 8 figures. L.C.

SMITH, A. H. and COUPE, R. R. Physical aspects. Experimental observations on the penetration of oil from ink into paper. Intern. Bull. for the Printing and Allied Trades no. 61: 21-5; discussion: 25-7 (July, 1952).

The rate of varnish penetration from the ink into the paper has been observed by using a cathode-ray oscilloscope at the instant of ink application to measure the change in the amount of light scattered from the reverse side of the paper. The rate of penetration by this method was found to be dependent on the pigment concentration in the range of 3.5% to 17.5% (carbon black in mineral oil) in contrast to the previous conclusion of Voet and Brand (*cf.* B.I.P.C. 16: 522) that no further decrease in penetration resulted beyond 5% pigmentation. The ultimate depth of penetration has been determined by two methods: by finding the volume of unfilled voids using linseed

oil to fill them, and by cross-sectioning the printed sheet using the polyethylene block method of Banks and Evans and then observing microscopically the depth of penetration of the iodine-stained varnish area. There was only moderate concurrence between the results of the two methods; theoretical reasoning is advanced to explain the differences. 1 table, 7 figures, and 5 references. L.C.

PHYSICAL TESTING—PAPER—PRINTABILITY

GOETZ, FREDERICK W., TRAVIS, E., and HALL, C. D. Portable automatic inking device. Printing Equip. Engr. 83, no. 3: 89 (December, 1952).

A portable automatic device has been developed for the uniform inking of the No. 4 Vandercook proof press which is employed in the inspection of paper manufactured for printing purposes. The details of the unit, primarily a fountain and pick-up roll, and of its mounting are described. The ink distribution is so accurately controlled that all samples tested are subject to identical conditions. 3 illustrations. L.C.

PHYSICAL TESTING—PAPER—THICKNESS

LEIGHTON, G. J. Radioactive thickness gage controls paper weight. Electronics 25, no. 12: 112-13 (December, 1952).

Isotope Products Limited, Oakville, Ont. has developed a new thickness gage and associated recording and controlling equipment to keep paper weight constant within 1%. The radioactive device, applicable for measuring the thickness of sheet material of any kind, consists of a measuring head and a control console. The head is made up of an ionization chamber and a radioactive source mounted on either end of a U-shaped tube with a gap of approximately two inches through which the sheet passes. On one arm of the tube is a sealed box containing a three-stage d.-c. amplifier using a 100% negative feedback, a second ionization chamber, and sources used for balancing. The amplifier portion of the betameter is described, and a schematic drawing of it is given. Measurements are taken at the wet end of the paper machine, a method which provides higher sensitivity and closer control. 3 figures. L.C.

PHYSICAL TESTING—PAPER—VAPOR TRANSMISSION

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Water vapor permeability of sheet materials at 0°F. Tappi 35, no. 12: 129-31A (December, 1952); *cf.* B.I.P.C. 17: 138-9.

The text of TAPPI Tentative Standard T 482 m-52 for the determination of water-vapor permeability of paper, paperboard, and flexible packaging materials under storage conditions at 0°F. is presented for criticisms and comments. 3 figures and 1 reference. E.S.

PLASTICS—HONEYCOMB

SEIDEL, ROBERT J. Paper-honeycomb cores for structural sandwich panels. J. Forest Products Research Soc. 2, no. 4: 13-22 (November, 1952); Paper Ind. 34, no. 9: 1112-15 (December, 1952).

The bonding of honeycomb cores of resin-treated kraft paper between thin and strong facing sheets (e.g., Douglas-fir veneer or tempered hardboard) results in sandwich panels which find increasing structural applications. A

description is given of the materials employed in the facing sheets, the paper cores, the treatment of the paper, the fabrication of the core, the use of the correct core with a given facing, the cutting of the core, and the pressing of the elements. The properties of the sandwich panels (strength, dimensional stability and bowing, thermal conductivity, and resistance to fire and long outdoor exposure), supplemented by equations, are also described. 2 tables, 6 figures, and 11 references in the first, and 1 table and 6 figures in the second reference. L.C.

PLASTICS—TESTING

NITSCHE, R. Mechanical and permanence properties of laminates. Kunststoffe 42, no. 11: 399-402 (November, 1952). [In German] *cf.* B.I.P.C. 22: 39.

This is a somewhat condensed translation of the article by G. M. Kline. 4 tables, 5 figures, and 7 references. E.S.

WRIGHT, E. E. Stress relaxation in plastics and insulating materials. ASTM Bull. no. 184: 47-9 (September, 1952).

A constant deflection procedure for the direct measurement of stress relaxation or change thereof of plastics and insulating materials is outlined; it permits the evaluation in terms of a material's ability to maintain a tight assembly under conditions simulating actual use. The apparatus for carrying out the tests is described, and typical data on the stress relaxation of cellulose acetate butyrate and an electrical grade laminated phenolic are given to illustrate the usefulness of the test. 6 figures and 1 reference. E.S.

PRINTING AND PRINTER'S INK

BANKS, W. H. Ink drying. General introduction. Intern. Bull. for the Printing and Allied Trades no. 61: 14-15 (July, 1952).

In a paper serving to introduce others on ink drying, the author divides the drying process into two phases: the physical process of ink penetration by capillary filtration, and the chemical process of film formation by oxidation. The rate of ink penetration is dependent on a motive force in the form of a capillary-pressure gradient and the combined resistances of the paper and ink in series to the flow of the vehicle through the two. Influences which affect oxidation are the removal of the metal catalyst from the oil phase by interaction with certain anions in the lithographic fountain solutions, the adverse drying effect of moisture from the fountain solution, and the absorption of the metal drier catalyst by the paper stock itself. The effect of moisture in paper on the drying of inks is mentioned briefly. 1 figure. L.C.

CARLSSON, G. E., and PIHL, L. Chemical aspects of ink drying. Some investigations on the drying of lithographic inks. Intern. Bull. for the Printing and Allied Trades no. 61: 31-2; discussion: 44-5 (July, 1952).

A short account of Swedish investigations on the causes of the slow drying of litho inks is given. Samples of ink were taken from the fountain roller and the plate and examined for water content and drying time. Emulsified fountain water in the ink sample taken from the plate was found to be the primary cause of slow drying. Increased pH of the fountain solution was a contributory cause. The effect of the negative ion of the fountain solution was considerable; it was at a minimum for chromate and nitrate anions and at a maximum for primary phosphate, citrate, oxalate, and sulfate ions (listed in descending order). Mention is made of a calcium perborate drier developed

in the Swedish laboratory for which the claim is made that it eliminates practically all the drying problems arising from fountain-water emulsification. 5 tables. E.S.

CLULOW, F. W. Some fundamental considerations in printing applied to packaging. J. Inst. Packaging 2, no. 15: 87-90; discussion: 90-1 (1st quarter, 1952).

Letterpress, lithographic, and photogravure printing are defined and further described as to their tone of reproduction, the characteristics of their prints, and the merits, limitations, and recent advances in the processes. Aniline printing is cited as one of the improvements in package printing. The best process is the one best suited to its particular application. L.C.

COUPE, R. R. Chemical aspects of ink drying. Adsorption of cobalt naphthenate by cellulose fibres. Intern. Bull. for the printing and Allied Trades no. 61: 40-3; discussion: 44-5 (July, 1952).

It has been established that irreversible adsorption of cobalt naphthenate will take place from linseed-oil solutions on paper and that, using the capillary-rise technique, the degree of adsorption is dependent upon the acidity of the paper. It has not been fully established whether this adsorption is responsible for ink drying troubles but, if it is, a means of overcoming the trouble is indicated. Other more readily adsorbed soaps could be added to the ink, thereby "protecting" the cobalt, or cobalt could be added to the paper during manufacture. 2 tables, 6 figures, and 3 references. E.S.

COUPE, R. R. Chemical aspects of ink drying. The inhibition of drying of lithographic varnishes by acid and salt solutions. Intern. Bull. for the Printing and Allied Trades no. 61: 32-9; discussion: 44-5 (July, 1952).

In a study to determine those salts and acids which have a marked effect on the drying time of lithographic inks, the author established that phosphoric acid and phosphates and sulfuric acid and acid sulfates have marked inhibiting effects, whereas the nitrates and chlorides showed little effect. Cobalt nitrate and chloride were found slightly better driers than the sulfate and phosphate. No definite conclusion can yet be drawn and no general recommendation can be made without further work. From the printing angle, there is no good reason why inorganic salts are required in the fountain solution, and the author concludes that they should be omitted. 12 tables, 6 diagrams, and 13 references. E.S.

KING, CHARLES F. What printing process for what job? Tappi 35, no. 12: 113-15A (December, 1952).

The author discusses the influence of ink, printing presses, and paper on the selection of a particular printing process for a given job, with particular emphasis on the two factors of cost and time of delivery. E.S.

PRINTING AND PRINTER'S INK—ANILINE PROCESS

ZUCKERMAN, ROBERT. New name for 'aniline' printing method reflects vast range of applications. Paper & Paper Products 94, no. 7: 12-14 (Dec. 20, 1952); *cf.* B.I.P.C. 23: 119.

Some of the variety of printing jobs which are possible on the aniline press

are given to attest to the appropriateness of the Packaging Institute's new name for the process, "flexographic printing." The general features of this process, basically a letterpress operation, are described, as well as the variations and refinements of these features for specific applications. The chief advantages and disadvantages of the process are listed. 1 illustration. L.C.

PULP

KEENEY, FREDERICK C. Physical properties of slash pine semichemical kraft pulp and of its fully chlorited component. Tappi 35, no. 12: 555-63 (December, 1952).

A semichemical kraft pulp, its chlorited component, and a chemical kraft pulp were prepared from slash pine. The strength properties of the semichemical pulp were lower than the corresponding properties of the chemical pulp. However, the latent strength of the former was developed through treatment with acidified sodium chlorite. This resulted in a pulp with strength properties that were generally higher than those of the chemical pulp. The principal reason for the differences in strength between the semichemical and the chemical pulp was that the former did not have as many fibers per sheet cross section among which to distribute the load. After chloriting, the strength of the semichemical pulp was increased, because there was a larger number of fibers per sheet cross section; the flexibility and degree of swelling of the fibers increased, which improved the opportunities for fiber-to-fiber bonding; the weighted average fiber length did not change on refining; and the surface properties were changed so that sheets with higher degrees of bonded area and bonding strength could be formed. 11 tables, 10 figures, and 19 references. E.S.

RAGS

BIGLER, OSCAR A. Buying and use of roofing rags. Paper Trade J. 135, no. 23: 18, 20 (Dec. 5, 1952).

The roofing industry, which formerly used 100% rags to make its felt foundations, is at present using only 25% rags and has substituted wood fibers for the balance. The author feels, however, that no substitute meets the strength, flexibility, and saturating capacity of rag-content felt. Market irregularities in rag buying are caused to a large extent by the partial rag users who buy only when prices are low. The author asks suppliers to sell primarily to dependable rag users and advises the producers of high rag-content felts to regulate their raw material inventories. A steady flow of supplies will result, to the benefit of both buyer and seller. Competitive conditions govern prices in any case. L.C.

RAYON—VISCOSE PROCESS

KOHLITZ, WERNER. A new method for the quantitative determination of gel particles in colloidal solutions, viscose in particular. Reyon, Zellwolle u. Chemiefasern 30, no. 7: 343-6 (July, 1952). [In German]

An apparatus and procedure are described for allowing a viscose solution to flow through a glass-ring nozzle with 0.7 mm.-wide slits into water, whereby the gel particles in the viscose become visible to the naked eye and can be counted. This is an improvement over the previous procedure in which a 1 mm.-wide glass capillary was used which permitted the study of very small viscose quantities only (3 ml. of viscose in the glass capillary in 15 minutes as compared with 16 ml. in the glass-ring nozzle in six minutes). For viscoses which contain fillers, such as titanium dioxide, a ring nozzle of V2A with

0.3 mm. slits gave more accurate results. The method can also be applied to the determination of gel particles in cellulose acetate in acetone solutions or to other colloidal solutions. The significance of the gel-particle count as a contribution for the evaluation of the filtering properties of viscose is discussed. 4 tables, 4 figures, and 2 footnotes. E.S.

RESEARCH LABORATORIES

ANON. New basic research laboratory of Southern Kraft Division of International Paper Company dedicated. Southern Pulp Paper Manuf. 15, no. 12: 26, 28, 30-1, 93 (December, 1952); Paper Ind. 34, no. 9: 1078, 1081-2 (December, 1952); *cf.* B.I.P.C. 23: 277-8.

A somewhat more detailed description is presented than given in the previous references. 6 illustrations. E.S.

BLAIS, MERLIN. Giant jobs with midget mill. Am. Forests 58, no. 12: 20-1 (December, 1952); *cf.* B.I.P.C. 23: 123.

The new development laboratory of the Crown Zellerbach Corp. at Camas, Wash. and its principal equipment are described. 7 illustrations. E.S.

PRINTING, PACKAGING AND ALLIED TRADES RESEARCH ASSOCIATION. First international conference of printing research institutes. Intern. Bull. for the Printing and Allied Trades no. 61: 6-14 (July, 1952).

Delegates to the conference described their research institutes, their administrative organization, and the financial arrangements which have been made to support them. The following descriptions are given, listed by authors and titles: Riddell, G. L. The Printing, Packaging and Allied Trades Research Association (Great Britain)—5 charts, p. 6-10; Carlsson, G. E. The Graphic Arts Research Laboratory in Sweden, p. 10-11; van der Meer, J. H. Research Institute T.N.O. for the Printing and Allied Industries (Holland), p. 11-12; Bargilliat, Alain. Centre Technique des Industries Graphiques (France), p. 12-13; Anon. The Graphic College of Denmark, p. 13; and Albrecht, J. Institut der Deutschen Gesellschaft für Forschung im Graphischen Gewerbe EV, p. 14. L.C.

RESIN, SYNTHETIC—IDENTIFICATION

KÜNDIG, S. Analysis of cellulose fibers impregnated with urea- and melamine-formaldehyde resins. Textil-Rundschau 7, no. 10: 451-64; no. 11: 501-27 (October, November, 1952). [In German]

The nature and formation of the resins are discussed, and several methods for the detection and quantitative estimation of the resins are reviewed in detail. The experimental work deals with the analysis by formaldehyde and nitrogen determinations and studies on the hydrolysis of melamine resins as a factor in their analysis. 34 tables, 18 figures, and 39 references. B.L.B.

SEMI-CHEMICAL PULPING PROCESS

HALL, J. A. Today's semichemical pulp industry. Southern Pulp Paper Manuf. 15, no. 12: 60, 62-5, 90 (December, 1952).

The semichemical pulping process has recently advanced to the status of

a major pulping method with an annual wood consumption of about a million cords in 26 mills. The process obtained its start because of the particular suitability of hardwood semichemical pulp for corrugating board in the greatly expanding paperboard industry, but bleached products of a wide range of usefulness are also being made in increasing amounts. The process is especially suitable for the production of useful products from hardwoods. The economical significance of high-yield processes in times of diminishing wood supplies and increasing demands for paper products and the part played by semichemical pulping in these developments are discussed. 3 tables. E.S.

KESWICK, R. J. P. Semi-chemical pulping at Bathurst. Pulp Paper Mag. Can. 53, no. 12: 127-31 (November, 1952); *cf.* B.I.P.C. 21: 802, 871.

The wood handling, chipping and screening, cooking and stock-handling equipment, control and operations, and maintenance of the first Canadian mill to produce pulp continuously are described. Different cooking liquors have been employed since the plant was started, including white liquor of 35% sulfidity diluted 50% with kraft-mill black liquor, dilute white liquor of sulfidities varying from 7 to 35%, dilute commercial caustic, and dissolved soda ash. All liquors produced a reasonable-quality stock; those in which sodium sulfide was present required washing to eliminate contaminating odors. A trial run with pure caustic indicated complete removal of odors, so that the brown-stock washers could be by-passed. When dissolved soda ash had to be used in an emergency e.g., when heavy snowstorms prevented the scheduled delivery of caustic tank cars, almost equally good results as with caustic liquor were obtained. As long as the stock was being washed, the yield was approximately 80%; since then indications are that it amounts to more than 90%. The resulting stock is a coarse fiber which gives excellent results as corrugating medium when mixed with 20% kraft stock. The flat crush test is roughly double that obtained on the previously manufactured kraft medium. 1 flowsheet and 8 illustrations. E.S.

SIHTOLA, HEIKKI. Semichemical pulping of unbarked sawmill waste; experiences at Veitsiluoto. Svensk Papperstidn. 55, no. 21: 807-15 (Nov. 15, 1952); Paper and Timber (Finland) 34, no. 11: 409-18 (November, 1952). [In Swedish and Finnish; English summaries]

Reference is made to the lack of interest and experience in the Scandinavian countries to date with regard to semichemical pulping. The growth cycle of spruce and pine in northern Finland is about 90-100 years; cull wood was hitherto mostly allowed to go to waste. In an effort to find a profitable outlet for this second-grade wood, semichemical pulping experiments with (principally) unbarked spruce and pine sawmill waste were initiated at the Veitsiluoto mill. About 2500 experimental cooks on a laboratory scale (2 liters each) were made in six series, in which the cooking time was varied from 5 to 60 minutes, the temperature from 130 to 200°C., and the bark percentage from 0 to 24%. At high temperatures and low chemical ratio in both alkaline and acid cooks, heavy hydrolysis was found to take place which results in extensive fiber degradation and reduction of the color, strength, and yield of the pulp. A light and strong pulp from coniferous wood can be obtained in less than one hour's cooking time, provided the chips are subjected to an effective presoaking treatment. Pulps cooked with straight caustic soda require a high power input for refining; when the lignin content exceeds 28%, the consumption drops rapidly. To obtain a good quality of semichemical pulp from northern softwoods by a so-called quick cooking method, the pH during

the entire cooking process must be kept on the acidic side, in addition to the mentioned presoaking treatment. A description of the semichemical-mill installations at Veitsiluoto is given, including a Chemipulper-Defibrator and a Sprout Waldron refiner. The mill has produced about 40 tons per day of pine semichemical pulp from unbarked sawmill waste in yields of about 65-67% of a grade particularly suitable for the manufacture of roofing felts, when the cooking temperature was held at 192°, the pressure at 13.5 atm., and the alkali consumption at 10-12% (of the ovendry wood); the steam consumption amounted to about one ton and the power for refining to 250-350 kw.-hr./ton of pulp. The new installation is not quite complete and certain operating troubles are mentioned. The high price of caustic soda in Finland is a decided disadvantage, particularly because the mill has no recovery system. Better results might be obtained with barked instead of unbarked wood. The author concludes that semichemical pulp will not make a good market pulp, but will give satisfactory results in an integrated paper or board mill. 12 and 13 figures. E.S.

SETUP BOXES

C. ALBERT SAUTER COMPANY, INC., *Philadelphia.* A *folding* setup box? Modern Packaging 26, no. 4: 98-100 (December, 1952); *cf.* B.I.P.C. 23:45.

This company has developed a "tapered" box which combines a setup box lid of chipboard with a folding-box base of boxboard. The "Taper-Pak," a truncated pyramid which can be nested readily, comes in three sizes and is a sturdy, decorative gift box for soft goods. The base is die cut on a platen cutting-creasing press and the lid is die cut on a quad stayer and glued; it is covered by a standard box-wrapping machine adjusted for the trapezoidal shape. Bloomingdale Bros. department store has exclusive rights to the use of the box in the New York metropolitan area. 5 illustrations. L.C.

SHIPPING CONTAINERS

PAYNE, A. W. A user's views on fibreboard and wooden packing cases. J. Inst. Packaging 2, no. 15: 103-5 (1st quarter, 1952).

Fiberboard and wooden utilitarian packing cases are discussed and compared for their respective advantages. Fiberboard cases offer economy of storage space for empty packs, lightness in weight, shock-resistant qualities when they are combined with good inserts (especially cell inserts), a saving in freight costs on returned empties, and a saving in initial cost. Wooden packing cases provide an unlimited capacity to carry weight and bulk, solid rigidity, the ability to withstand heavy superimposed loads and, with suitable internal cushioning, the capacity to be rolled, slung, or dropped. Plywood cases give the same protection as wooden cases, strength for strength, and are only slightly heavier than fiberboard cases of equivalent size; their price, however, is about three times that of their soft- or hardwood counterparts. L.C.

SHIPPING CONTAINERS—MULTIWALL BAGS

ANON. The American market for large-capacity shipping bags. Rev. papiers et cartons 15, no. 20: 9-10 (Oct. 15, 1952). [In French]

The different constructions of American single-ply or multiwall shipping bags, types of closures and papers employed, the usual physical characteristics of kraft bag paper, and the use of wet-strength paper are described. 1 table. E.S.

SHIPPING CONTAINERS—PALLETIZING

ANON. Expendable pallets improve materials handling. Fibre Containers 37, no. 11: 79-80 (November, 1952).

The various palletizing methods for handling knocked down taped and stiched corrugated board are: the expendable pallet method, the returnable wood pallet, the straight bundle method of unit loading, and the bundle pack with space posts or blocks. These methods are described and compared; the expendable pallet method is considered the most expeditious for materials handling. Directions are given for making corrugated pallets from waste stock and corrugated board posts. 7 illustrations. L.C.

U. S. DEPARTMENT OF COMMERCE. *National Production Authority.* Major considerations in industrial palletization. Tappi 35, no. 12: 38A, 40A, 42A, 44A (December, 1952).

Following a brief history on the development of palletization (I) in the United States—limited use dates back into the prewar period—the principal economies and obstacles as well as the growth pattern of industrial (I) are discussed, supplemented by statistical data. The major types of pallets in general use are fabricated from wood, metal, or paper, or a combination of these materials; a recent development has been pallets constructed of plastic. The advent of (I) had in general no effect on the containers and packaging materials in current use. Lack of uniform sizes and square containers were by far the most frequently mentioned complaints concerning the adequacy of containers for (I); the need for standardization of both containers and pallets is strongly emphasized. No definite conclusions were reached on whether the installation of pallets resulted in increased or decreased container consumption, although the over-all change seems to be negligible. 5 tables. E.S.

STANDARDIZATION

ANON. British standard sizes of single ply paper bags. Paper Box Bag Maker: 197 (November, 1952).

The article is an announcement that the British Standards Institution has published a standard which lists the generally accepted sizes of the single-ply paper bags most commonly used for packaging. Six of these bags are illustrated diagramatically as a key to the method and order of measurement used when sizes are quoted. L.C.

STARCH

MATTISSON, M. F., and Legendre, K. A. Determination of the carboxyl content of oxidized starches. Anal. Chem. 24, no. 12: 1942-4 (December, 1952).

The determination of the carboxyl content of commercial oxidized starches has long been used to estimate the degree of oxidation. Existing methods are based on similar procedures for cellulose. The usual method requires the starch to be leached with hydrochloric acid to remove any existing cations, followed by exhaustive washing to remove the hydrochloric acid. The starch is then treated with calcium acetate solution, which unites calcium to carboxyl, freeing acetic acid which is determined by titration. A new method is proposed wherein the starch is pasted after the acid leaching and washing and the liberated carboxyl groups are titrated directly. This procedure eliminates the involved calcium acetate treatment of the older method, and is simple, shorter, and more precise. 4 tables, 1 figure, and 9 references. E.S.

MEYER, KURT H. The past and present of starch chemistry. Experientia 8, no. 11: 405-20 (November, 1952). [In English; French summary]

The author reviews the evolution of starch chemistry from its origin to the present state of knowledge, with particular reference to the contributions of the botanists, colloid and organic chemists, and enzymologists in elucidating the structure and constitution of starch. In conclusion, the properties of amylolytic enzymes, their mode of action, and the part they play in the degradation or synthesis of starch polysaccharides are discussed. 2 tables, 13 figures, and 182 references. E.S.

STATIC ELECTRICITY IN PAPER

[KOTTE, HANS] Elimination of electrostatic charges in paper rolls. Allgem. Papier-Rundschau no. 13: 599 (July 12, 1952). [In German]

The "Corona" electric-bar neutralizer, a Swedish development, for the elimination of static electricity in high-speed printing and converting machinery is described. E.S.

STORAGE BATTERIES

GOULD-NATIONAL BATTERIES, INC. Latest tips on battery maintenance. Paper Trade J. 135, no. 26: 23-4 (Dec. 26, 1952).

Suggestions for the removal and replacement of damaged covers on industrial-truck storage batteries are given, as well as for the withdrawal of cover and elements together for basic repair. 4 illustrations. L.C.

STREAM POLLUTION

HAYDU, E. P., AMBERG, H. R., and DIMICK, R. E. The effect of kraft mill waste components on certain salmonoid fishes of the Pacific Northwest. Tappi 35, no. 12: 545-9 (December, 1952).

Selective bioassays were undertaken to determine the toxic range of some of the chemical constituents normally found in kraft-mill effluents on some salmonoid fishes in the Pacific Northwest. Once the degree of toxicity of these constituents is known, it is possible to arrive at a more rational solution of waste disposal. The results of the studies presented warrant the following conclusions: Minimum lethal and critical concentrations for the most susceptible fish of the three test species to sulfides were approximately 0.5 and 1.0 p.p.m., respectively (calculated as sulfur). Methyl mercaptan produced distress and mortality at approximately the same concentration as the sulfides. A large percentage of salmon and trout were capable of complete recovery from the effects of hydrogen sulfide and methyl mercaptan, provided that they were immediately removed upon reaching the "belly-up" position. The amounts of sodium hydroxide, sodium carbonate, sodium thiosulfate, and sodium sulfate that would pass to the sewer under normal kraft-mill operation would be insufficient to kill salmonoid fishes of the Pacific Northwest. Of these four compounds, sodium hydroxide would be the most critical, having a threshold limit of approximately 10 p.p.m. 6 tables, 6 figures, and 6 references. E.S.

HOAK, RICHARD D. Sources and control of river pollution. Instruments 25, no. 12: 1714-6, 1748, 1750, 1752 (December, 1952).

The author discusses sources of pollution (erosion, storm-water runoff

from urban areas, domestic sewage, industrial waste, and acid mine water), varieties of pollution (inert, toxic, inorganic, and organic), stream self-purification properties, and pollution control (control at source and treatment of waste). The possibilities for the application of instruments to both types of pollution control are discussed, including existing instruments which may be adapted and others which have yet to be developed, with particular emphasis on the desirability of obtaining a continuous record of stream conditions. 5 illustrations. E.S.

MURDOCK, HAROLD R. Industrial wastes. Ind. Eng. Chem. 44, no. 12: 95-7A (December, 1952).

The author discusses the possibilities of the potamological method for evaluating streams for the purpose of disposal of specific industrial wastes. Potamology involves a basic understanding and composite knowledge of the physical, chemical, meteorological, and biological conditions of running waters. Potamologists agree that the best biological index for the evaluation of stream conditions is the one based upon the sessile forms of plants and animals in a stream at different locations, because they reflect water conditions which have existed over a considerable period of time; this is far more significant than a mere chemical analysis which represents only the stream conditions at the time of sampling the water. The work of the National Council for Stream Improvement is quoted as a pioneer in the application of this biological stream-analysis method. E.S.

RUDOLFS, WILLEM, and HANLON, WILLIAM D. Color in industrial wastes. III. Color of suspended solids, and applications for waste color characteristics. Sewage Ind. Wastes 24, no. 12: 1502-8 (December, 1952); *cf.* B.I.P.C. 22: 613.

A study was made for the purposes of (*a*) developing a method for expressing the effect of suspended matter on the color characteristics of industrial wastes; (*b*) using industrial waste light absorption properties for calculating the concentration of industrial wastes in stream waters; and (*c*) investigating methods for projecting industrial waste-color characteristics to stream conditions. The wastes used in each part of the study, respectively, were: (1) clear dilute sulfite cooking liquor mixed with a Dicalite white filler solution; (2) yeast and beet canning waste; and (3) spent sulfite liquor. A method is presented for expressing the color characteristics of industrial waste suspended solids in terms of the visual hue and the degree of light absorption effected solely by the suspended matter. The principle of Beer's law was adapted to the light-absorption properties of polluted stream waters for the purpose of calculating the concentration of two or more contaminating wastes. The direct projection of industrial waste-color characteristics to actual stream conditions is not feasible. However, these color characteristics may be extended to longer light absorption cells which are more suitable for stream-water standards. 3 tables, 3 figures, and 3 references. L.C.

SULFITE WASTE LIQUOR

ANNETT, S. R. P., and STOBO, W. E. Utilization of sulfite pulp mill wastes . . . and their markets.. Paper Ind. 34, no. 9: 1109-11 (December, 1952); *cf.* B.I.P.C. 23: 205.

This gives essentially the same information on the new Lignosol plant in Quebec as the previous reference. 1 illustration. E.S.

ARIES, ROBERT S., and POLLAK, ARTHUR. The Sulfox process for recovering chemicals from sulphite mills. Tappi 35, no. 12: 142-6A (December, 1952).

The new Sulfox (sulfide oxidation) process provides for the burning of spent sulfite liquor and the recovery of the inorganic chemicals. The usual lime or dolomite base of the sulfite cooking acid is replaced by a soda base, which can be supplied either as soda ash, salt cake, or sodium sulfite. The waste liquor is collected, evaporated, burned, and smelted very much in the same way as now done in the sulfate industry. The resulting smelt, principally sodium sulfide and sodium carbonate, is then dissolved and subjected to a controlled air oxidation. This yields a mixture of sodium sulfite and sodium carbonate suitable for re-use in the preparation of fresh sulfite cooking liquor. Most of the steps of the Sulfox process utilize equipment which can be assembled from items on the market in standard sizes. The process can utilize spent sulfite liquor alone or mixed with other spent liquors, such as black liquor, without impairing its effectiveness or that of either of the pulp processes. The cost for installations in sulfite mills is claimed to be lower than that for sulfate mills of equal capacity. 6 tables, 6 figures, and 9 references. E.S.

GRIMMETT, R. E. R. Industrial utilization of agricultural wastes. Chemistry & Industry no. 48: 1177 (Nov. 29, 1952).

A process similar to that developed by K. F. Hoy at Rukuhia Soil Research Station (New Zealand) is suggested whereby concentrated spent sulfite liquor might be used as the source of crude oxalic acid in the production of a new mixed-acid type of superphosphate fertilizer. As proposed, the process would digest concentrated spent sulfite liquor with concentrated nitric acid in the presence of a vanadium catalyst at 70-80°C. until most of the sugars and lignin is converted to oxalic acid and the sulfur compounds converted in part to sulfuric acid. The crude reaction product mixed with rock phosphate would then be matured to yield a final superphosphate of mixed sulfuric, nitric, and oxalic acid types. A.J.W.

RHINELANDER PAPER COMPANY. Rhinelander starts Rosenblads. Paper Trade J. 135, no. 26: 11-12, 14 (Dec. 26, 1952); Paper Ind. 34, no. 9: 1074-6 (December, 1952); Chem. Eng. News 30, no. 49: 5196 (Dec. 8, 1952); *cf.* B.I.P.C. 23: 246.

With reference to the recent installation of Rosenblad channel-switching evaporators by the Lake States Yeast Corp., a subsidiary of Rhinelander Paper Co., the processing of the desugared lignin solution (I) left after yeast fermentation is described. (I) is evaporated to a sirupy consistency containing 50% solids. This concentrate is stored in two 10,000-gal. tile tanks and may be pumped in any of three directions: to driers for production of 94% dry solids, to a dock for loading tank cars or tank trucks, or to the boiler house for utilization as fuel. The desugared solids, whether in the dry or 50% concentrate form will be marketed under the trade name "Toralig." Principal uses are as adhesives, dispersants, and chemical raw materials. Whatever fraction remains unsold at any time will be piped in 50% concentration to the Rhinelander Paper Co.'s boiler room for burning as industrial fuel; this, however, will be only the last resort to prevent discharge of the liquor into the river. 4 illustrations in the first, 6 in the second, and 2 in the third article. E.S.

SULFUR DIOXIDE

ANON. SO_2 unit on stream. Can. Chem. Processing 36, no. 12:

44, 46 (November, 1952); Paper Ind. 34, no. 9: 1100, 1102 (December, 1952).

Canada's first plant for the manufacture of liquid sulfur dioxide has been brought into production at Copper Cliff, Ont. by Canadian Industries Limited. The plant will have an annual output of 90,000 tons, most of which will go to Ontario and Quebec sulfite pulp mills. 4 illustrations in the first reference. E.S.

SWELLING AND HYDRATION

CARROLL, M., and MASON, S. G. The measurement of fiber swelling by the liquid permeability method. Can. J. Technol. 30, no. 12: 321-33 (December, 1952).

The calculation of volume swelling of natural and synthetic fibers is described, based on the measurement of the liquid permeability coefficient of carefully formed pads of fibers and the application of the Kozeny-Carman equation. Measurements carried out on solid filaments of nylon, acetate, and viscose rayon in a nonswelling liquid were in good accord with the specific volume values obtained by displacement in the same liquid. Measurements on the same fibers swollen in water showed only fair agreement with those calculated from moisture regain and from centrifuging measurements. The volumes of mixtures of a water-swollen cotton and sulfite pulp were found to be additive. It is concluded that the method is generally valid and potentially useful in studying swelling phenomena. The swelling of pulp fibers in different liquids and the swelling effect during beating are briefly considered. 5 tables, 7 figures, and 21 references. E.S.

TEXTILE INDUSTRY AND FABRICS—ELECTRICAL RESISTANCE

HERSH, S. P., and MONTGOMERY, D. J. Electrical resistance measurements on fibers and fiber assemblies. Textile Research J. 22, no. 12: 805-18 (December, 1952).

The resistance of single textile fibers and of assemblies of these fibers has been studied because of its relation to the effects of static electricity in fibrous materials. An apparatus has been constructed to measure the resistances of fibers and assemblies from 10^5 to 10^{16} ohms at specified temperatures and relative humidities. Results of the measurements at 30°C. on some natural fibers (wool, cotton, hair, and silk) and on some synthetic fibers (rayon, acetate, nylon, and casein) are given for relative humidities from 52% to 85%. Some other synthetic fibers (Orlon, Dacron, Dynel, polyethylene, Velon) have resistances too high to be measured conveniently with the present apparatus. All the materials measured were found to be ohmic and largely free from polarization effects at voltage gradients up to several hundred volts per centimeter, the limiting values used in the study. The resistivities of all materials tested decreased rapidly with the increasing moisture content of the material; the resistivity varied inversely as the 7th to the 13th power of the moisture content. Reasonable correlations were found to exist between the resistances of fiber assemblies and the constituents thereof. 11 tables, 13 figures, and 15 references. E.S.

ULTRASONICS

FRANK, R. H. Inspection and measurement by ultrasonics. Instruments 25, no. 12: 1720-1, 1752-4 (December, 1952).

The principles, possibilities, and limitations of ultrasonic inspection of metal equipment are discussed. Automatic equipment (such as the Reflecto-

scope) is now becoming available. The operational technique and data interpretation are shown to be important factors. 10 figures. E.S.

VANILLIN

PEARL, IRWIN A., and BEYER, DONALD L. Reactions of vanillin and its derived compounds. XIX. Reaction of vanillin with silver oxide in the presence of technical caustic. Ind. Eng. Chem. 44, no. 12: 2893-4 (December, 1952); *cf.* B.I.P.C. 23: 131-2.

The reaction of vanillin with alkali and 0.5 mole of silver oxide was found to give quantitative transformations to vanillic acid in the laboratory when C.P. sodium hydroxide was employed, but the reaction gave anomalous results with technical grades of caustic. The use of caustic soda of grades lower than C.P. or U.S.P. in either the preparation of the silver oxide from the silver nitrate step or in the oxidation step gave either no vanillic acid whatsoever or only a small yield of the desired product. In a series of experiments, reaction mixtures of pure chemicals were treated with small amounts of impurities known to be present in technical caustic; in each case the impurity interfered with the reaction. The results indicate that the silver oxide process for the production of vanillic acid, which is so useful in the laboratory where the employment of C.P. chemicals is routine, is unsatisfactory for commercial practice where the excess cost of C.P. chemicals makes their use prohibitive. 1 table and 4 references. E.S.

WASTE

ANON. How Shelton handles trim and scrap. Fibre Containers 37, no. 11: 58-9 (November, 1952); *cf.* B.I.P.C. 22: 286.

The pneumatic trim-removal system serving the corrugator and printer-slotters at the plant of the Shelton Manufacturing Co. at Newark, N.J. is described briefly; it was designed and installed by Blower Application Co., Milwaukee. 6 illustrations. E.S.

CANADIAN CHEMICAL PROCESSING. From waste to product via research. Can. Chem. Processing 36, no. 13: 26-8 (December, 1952).

Canadian rice millers, faced with the expense of hull disposal, sponsored research into making a useful product from the waste. The hulls were found to contain a high proportion of silica and, therefore, an effort was made to develop a light-weight, insulating, highly refractory material for structural purposes from the rice-hull ash; a lime-silica ceramic bond was adopted. A completely satisfactory brick has not yet been developed, but the capillary, refractory, and strength properties of the material (Porosil) have given it a commercial application in humidifier plates for hot-air heating installations. The ceramic development program with refractory thermal insulator bricks continues. 4 illustrations. L.C.

MURDOCK, HAROLD R. Industrial wastes. Ind. Eng. Chem. 44, no. 11: 117-18A (November, 1952).

The author emphasizes the importance of the collection of solid wastes to improve the raw-materials situation of the country; steel and waste paper are cited as examples, and the need for public understanding and co-operation is stressed. E.S.

WASTE PAPER

KOENIG, F. Impregnated papers aggravate the sorting and re-

generation of waste paper. Allgem. Papier-Rundschau no. 22: 987-90 (Nov. 26, 1952). [In German]

This is a report of a conference of the German waste-paper industry in Hamburg in the fall of 1952, at which the problems and possible solutions of the recovery of different chemically treated waste papers were discussed, which at present cannot be regenerated satisfactorily and which endanger the smooth operation of the entire waste-paper trade. The development of impregnated specialty papers for different applications in the packaging industry is only at its beginning, so that in the future still greater difficulties must be expected. The situation is further complicated by the fact that the low price of waste paper cannot stand heavy increases through careful sorting and that no universal treatment or agent for the removal of the different impregnating agents exists or is likely to be found in the future. Hence, individual treatment is required for each group and this must not exert a degrading effect on the fibrous component. Reference is made to the development of a satisfactory procedure for the continuous removal of bituminous substances (I), the results of which have been confirmed in actual mill operation. The principal portion of (I) is removed rather rapidly by mechanical treatment; for the complete removal of the residues, solvents (xylene or benzene) must be employed. No satisfactory agent for the treatment of wet-strength waste papers has yet been found. The different discussions emphasized the seriousness of the problem and illustrated the need for a coordinated effort of the waste-paper trade, paper and board manufacturers, and chemical research, preferably on an international scale. Although a satisfactory solution to the problem is not yet known, it is imperative that the search be continued, because approximately one third of the paper and board industry depends upon waste paper and cannot dispense with this raw material. E.S.

WAXES

ANON. Impermeabilization of packages with paraffin. Rev. papiers et cartons 15, no. 19: 15-16, 18 (Oct. 1, 1952). [In French]

The important part which paraffin plays in the protection of packages against the ill effects of moisture is discussed; reference is made to emulsions composed of paraffin and plasticizers. In addition to dipping procedures—which can only be employed with comparatively small packages—the advantages of the gun-spraying technique are outlined. E.S.

OHL, FRITZ. Micro waxes for the conversion of paper and board. Allgem. Papier-Rundschau no. 21: 952-4 (Nov. 12, 1952).

The author describes the types of microcrystalline waxes available in Germany, their properties, possible applications, and the advantages of combinations of paraffins and microcrystalline waxes with other substances, plastics in particular, for different use requirements. E.S.

SEUBERT, R. F., and ANDREWS, E. D. Antioxidant for waxes. Modern Packaging 26, no. 4: 153-4 (December, 1952).

Di-*tert*-butyl-*p*-cresol (DBPC, trademark of Koppers Co., Inc.), a trialkylated phenol, has been shown to be an effective deterioration inhibitor for petroleum waxes. Waxes compounded by modifying agents such as polyethylene can also be effectively inhibited to retard deterioration of color and odor. DBPC meets all the basic requirements of a good inhibitor, and its low order of toxicity suggests its application in all wax products, including those destined for food packaging. 4 figures and 7 references. L.C.

WHITE WATER

RUDOLFS, WILLEM, and AMBERG, HERMAN R. White water treatment. IV. Mesophilic and thermophilic digestion. Sewage Ind. Wastes 24, no. 12: 1509-11 (December, 1952); *cf.* B.I.P.C. 23: 285.

In white water clarification, sludge disposal is a major problem because some mills are unable to use this sludge in their furnish. The volatile constituents of paperboard sludge (I) constitute about 80% of its dry weight. Digestion of (I) under mesophilic and thermophilic conditions was undertaken. Laboratory studies showed that (I) can be digested readily and can be handled by sewage treatment plants if sufficient capacity is available. On a volatile matter basis, mixtures of (I) and fresh sewage solids will produce less gas than will the sewage solids alone, because (I) produces less gas than do sewage solids. Thermophilic digestion appears less effective than mesophilic digestion. The latter decreases the sludge volume materially by volatile matter destruction and changes in the water-holding capacity of the sludge, which allows better compaction. 4 tables and 1 reference. L.C.

WOOD—EXTRACTIVES

ANDERSON, ARTHUR B. Some practical applications of wood chemistry research. J. Forest Products Research Soc. 1, no. 1: 72-4 (September, 1951).

The author describes briefly the results of a number of research projects involving extractives of western tree species, including rosin and turpentine from ponderosa pine stumps, extractives from Douglas-fir bark and Jeffery pine stumps, and pinitol from sugar pine. 9 references. E.S.

GRIPENBERG, JARL. The chemistry of the natural order *Cupressales*. IX. The synthesis of hexahydrothujic acid. Acta Chem. Scand. 6, no. 6: 854-8 (1952). [In English] *cf.* B.I.P.C. 23: 134.

In a previous communication of this series (*cf.* B.I.P.C. 22: 445) the partial synthesis of thujic acid was reported; in the present paper the synthesis of 4,4-dimethylcycloheptanecarboxylic acid (hexahydrothujic acid) is described. This synthesis completes the total synthesis of thujic acid. 7 references. E.S.

WOOD—MOISTURE

VALEUR, CHR. The influence of the moisture of the wood upon the quality and yield of sulfate pulp. Svensk Papperstidn. 55, no. 20: 776-83 (Oct. 31, 1952). [In Swedish; English and German summaries]

A number of laboratory cooks were made in a 15-liter revolving digester with moist and dry wood from Swedish pine. The samples were soaked or dried, respectively, in the form of logs or chips. The following conclusions are drawn from the results obtained: When the digester is charged with moist wood, the same result as far as pulp yield and quality are concerned will be obtained, irrespective of whether the wood had been previously dried or not; neither does the moisture content of the wood during chipping exert an influence. If the wood is charged dry and not steamed, the resulting pulp will give a slightly lower strength than that from moist wood; however, the differences are small. In addition, dry wood seems to give higher screening rejects. When the dry wood is thoroughly steamed before cooking, the results

are almost equal to those obtained with moist wood. Emphasis is placed upon the fact that it may not be possible to duplicate exactly these laboratory results in mill operation where conditions are not under such perfect control as on a small scale. 11 tables, 3 figures, and 3 references. E.S.

WOOD OPERATIONS

ADAMS, NELSON W. Markets and marketing—the key to better woodlot management. Pulp Paper Mag. Can. 53, no. 13: 121-2; discussion: 122 (December, 1952).

The author encourages companies to do their own wood purchasing, thus eliminating the small broker who takes undue advantage of market fluctuations for personal profit and does not buy in terms of sustained yield from productive, well-stocked woodlots. L.C.

HART, ARTHUR C. A table of production rates for cutting spruce and fir pulpwood. J. Forestry 50, no. 7: 557-8 (July, 1952).

To aid wood managers in planning operations, the Northeastern Forest Experiment Station has compiled a table of production rates by tree-diameter classes for cutting spruce and fir. The production table, which is based on time studies of five commercial pulpwood operations, lists the time factors for the calculation of the production rates for rough and peeled skidded and stump wood, which indicate that great savings could be made in labor requirements by cutting no tree less than 9 or 10 inches d.b.h. The application of the table is explained. 1 table. L.C.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record, *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ASPLUND PROCESS

MESSING, HJALMAR S. Treatment chambers for ligno-cellulose material and the like. U. S. patent 2,623,820. Filed April 21, 1949. Issued Dec. 30, 1952. 5 claims. [Cl. 92-7]

This refers to a modification of the Asplund system in which one or more treatment chambers are used. These are introduced between the feeding means and the defibrating mechanism. The purpose is to increase the capacity of the apparatus. 2 figures. C.J.W.

BARKERS AND BARKING

DICK, GEORGE M. Log barking device. Canadian patent 488,559. Filed June 11, 1949. Issued Dec. 2, 1952. 6 claims. Assigned to Ingersoll-Rand Company.

In a barking drum, the hoops have finger-shaped marginal portions extending laterally therefrom; the fingers are tapered laterally outward. Longitudinally disposed staves are arranged on the periphery of the hoops and welded to the fingers. 4 figures. C.J.W.

SHAW, ERNEST C., and JENSEN, MELVIN L. Hydraulic barker with multiple nozzle oscillating linkage. Canadian patent 488,505. Filed Oct. 26, 1951. Issued Dec. 2, 1952. 15 claims. Assigned to Allis-Chalmers Manufacturing Company.

A hydraulic barker incorporates oscillating water jets which are automatically adjusted to accommodate logs of various sizes in response to changes in the position of the jets in relation to the log conveyor bed. This is the same as U. S. patent 2,576,861 (Nov. 27, 1951); *cf.* B.I.P.C. 22: 367-8. 6 figures. C.J.W.

BOARD

BAKER, MERLE W., BEIL, FORREST F., CURTIS, CHARLES F., II, and PATTON, EDWARD A. Method of making cellulose boards. U. S. patent 2,619,681. Filed May 5, 1951. Issued Dec. 2, 1952. 6 claims. Assigned to Curtis Companies, Incorporated. [Cl. 18-47.5]

A method is described for the manufacture of a cellulosic board from mechanically disintegrated wood waste and from 4 to 14% of a resin-forming binder, the mixture containing from 5 to 25% of moisture. This mixture is heated at 280 to 400°F. under a pressure of 150 to 500 p.s.i. for periods varying from 3.5 to 10 minutes. The higher the moisture content, the lower the pressure. The margins of the board are compressed more than the remainder to seal it against moisture loss during the pressing operation; the pressure is released slowly to prevent blistering of the board. 9 figures.
C.J.W.

PATTON, EDWARD A., and BEIL, FORREST F. Method for making cellulosic board. U. S. patent 2,618,813. Filed Sept. 14, 1950. Issued Nov. 25, 1952. 3 claims. Assigned to Curtis Companies, Incorporated. [Cl. 18-47.5]

Boards are formed from granulated wood waste (e.g., sawdust, finely divided wood waste from mill-work plants, and the like) and a thermosetting resin (e.g., phenol-, urea-, or furfural-formaldehyde resins) by subjecting the mixture to a heat-molding operation, the pressure (which may range from 150 to 400 p.s.i.) being correlated with the moisture content of the mixture. A typical mixture contains 86.3% mill waste, 6% phenol-formaldehyde resin with a flow point of 110 to 125°C. and a cure time of 80 to 100 seconds at 150°, and 7.7% water. The molding temperature of this mixture is 338°F. Examples are given of the effect of the molding pressure. 12 figures.
C.J.W.

BOARD, LAMINATED

LYIJYNEN, FRED. Apparatus for making laminated articles. U. S. patent 2,620,014. Filed March 24, 1948. Issued Dec. 2, 1952. 14 claims. Assigned to Briggs Manufacturing Company. [Cl. 154-1]

A die apparatus is described which is suitable for the manufacture of laminated panels suitable for the interior finish of an automobile. The foundation board is a rigid, stiff board material which may be made moisture resistant by impregnation with a resin or asphalt. The resinous or bonding material is a low-density absorbent sheet, such as alpha-cellulose paper which is impregnated with a thermosetting resin. The padding layer may be cotton batting. The outer covering is a fabric of cloth or artificial leather. 11 figures.
C.J.W.

BOARD COOLING

INGVE, BROR G. V. Arrangement for cooling of porous fiber boards. U. S. patent 2,618,807. Filed March 29, 1949. Issued Nov. 25, 1952. 5 claims. Assigned to A B Svenska Fläktfabriken. [Cl. 15-302].

An arrangement is described for the cooling of porous fiber boards after drying by sucking air through them. The apparatus consists of a suction box having a plane suction opening, a suction device, and an endless wire

screen consisting of a closed and an open portion in series which is adapted to be moved across the suction opening. 4 figures. C.J.W.

BOARD SPECIALTIES

LILLIE, EUGENE F. Breadbox. U. S. patent 2,620,118. Filed June 22, 1949. Issued Dec. 2, 1952. 2 claims. Assigned to A B C Corrugated Box Company. [Cl. 229-42]

A breadbox is of such construction that hot bread can be packed in it and then be transported to the retailer without noticeable shrinkage. It consists of a "bread pad" which is formed of corrugated board (preferably 200 pound) and which is placed in an ordinary fiberboard box. 3 figures. C.J.W.

NEMOEDE, PAUL A. Pallet load divider tray. U. S. patent 2,620,117. Filed June 9, 1950. Issued Dec. 2, 1952. 1 claim. Assigned to Container Corporation of America. [Cl. 229-30]

The construction of a pallet load divider tray is described; it is collapsible to substantially flat condition for storage or shipment and can be quickly erected for use as a common retaining means for adjacent sections of a load. The tray provides a lower portion to telescope over a lower load section and an upper tray portion to receive an upper load section. 3 figures. C.J.W.

CELLULOSE ETHERS

WILCOX, MERLYN H., DOWNING, JOHN, and DREWITT, JAMES G. N. Production of alkali cellulose. U. S. patent 2,619,483. Filed Sept. 28, 1948. Issued Nov. 25, 1952. 1 claim. Assigned to Celanese Corporation of America. [Cl. 260-233]

Granular wood pulp (which has been passed through a Banbury mixer), which has a packing density of 26 lb./cu. ft. and in which the individual particles are less than 0.1 inch across, is mixed with up to 2.5 times its weight of powdered or flake sodium hydroxide and 20% (on the weight of the cellulose) of monomethyl glycol; this mixture is then passed through a Werner-Pfleiderer mixer. The product is specially suitable for the manufacturer of cellulose ethers. C.J.W.

CHLORINE DIOXIDE

EKMAN, SVEN U. Methods of making chlorine dioxide. U. S. patent 2,620,260. Filed Jan. 8, 1948. Issued Dec. 2, 1952. 2 claims. Assigned to Mo och Domsjö Aktiebolag. [Cl. 23-152]

Chlorine dioxide is formed by the reaction of sulfur dioxide with an acid solution of sodium chlorate which is saturated with sodium sulfate at the reaction temperature. 2 figures. C.J.W.

COTTON

DANIELSON, ARTHUR C. Protection of cellulose fiber against heat aging. U. S. patent 2,616,822. Filed Sept. 14, 1949. Issued Nov. 4, 1952. 6 claims. Assigned to United States Rubber Company. [Cl. 154-52]

Cellulosic fibers are protected from the effects of heat by incorporating therein from 0.25 to 10% of guanidine carbonate. The treatment may be

applied to cotton fabrics and is particularly useful for cotton yarn for vulcanized rubber articles. The guanidine salts have no deleterious effect on the vulcanization process and resist vulcanizing temperatures. C.J.W.

DE-INKING

RUFF, HAROLD T., and STEVENSON, JAMES F., JR. Deinking waste paper containing groundwood. U. S. patent 2,620,271. Filed July 24, 1945. Issued Dec. 2, 1952. 3 claims. Assigned to The Mead Corporation. [Cl. 92-1.5]

The paper is treated with a hot sodium hydroxide solution (2 to 3% of sodium hydroxide on the airdry waste) and the washed material is bleached with sodium or calcium hypochlorite. This corresponds to Canadian patent 462,696 (Jan. 24, 1950); *cf.* B.I.P.C. 20: 446. 1 figure. C.J.W.

DIGESTERS

HOLGERSSON, SIGBJORN P. H. E., RYDBERG, DAVID R., and RUDBERG, MAC S. Digesters for cooking cellulose. Canadian patent 488,767. Filed Nov. 15, 1948. Issued Dec. 9, 1952. 5 claims. Assigned to Storviks Sulfit Aktiebolag.

A digester for pulping lignocellulosic materials and which may be subjected to subatmospheric pressures consists of an outer rigid casing and a relatively thin stainless steel lining disposed concentrically adjacent the inner surface of the walls of the casing but with a substantially continuous narrow space between the two. Means are provided for evacuating the space between the digester wall and the lining. 4 figures. C.J.W.

DISPENSING CONTAINERS

HARRIS, WARREN R. Dispensing container for labels and the like. U. S. patent 2,621,787. Filed April 20, 1948. Issued Dec. 16, 1952. 3 claims. [Cl. 206-57]

A container is described which is adapted to gummed labels; the face of the label to be dispensed is displayed for identification. 4 figures. C.J.W.

FOLDING BOXES

BERGSTEIN, ROBERT M. Folding box employing nonscorable sheeting. U. S. patent 2,619,275. Filed Jan. 6, 1947. Issued Nov. 25, 1952. 8 claims. [Cl. 229-31]

The object of the invention is to provide collapsible or folding structures consisting of panels of sheeting with articulated structures of other material, such as boxboard and a machine for their manufacture. The box may consist of three panels of cellulose acetate and a paperboard panel as the end wall. The use of the board end walls enables the manufacture of transparent boxes which have the desirable features of knockdown boxes. 29 figures. C.J.W.

BUTTERY, KENNETH T. Collapsible tray or carton. U. S. patent 2,621,783. Filed March 3, 1950. Issued Dec. 16, 1952. 2 claims. Assigned to Sutherland Paper Company. [Cl. 206-45.14]

A container is described which is adapted to receive a plurality of objects and to support them in side by side relation for display purposes, as well as to prevent their becoming shuffled about or displaced as the container is handled. 4 figures. C.J.W.

McDONOUGH, LINUS J. Double-walled carton. U. S. patent 2,620,116. Filed March 8, 1950. Issued Dec. 2, 1952. 2 claims. Assigned to Corson Manufacturing Company. [Cl. 229-14]

A double-walled container consists of a single sheet of material which, when folded, produces a smaller box held firmly in spaced relationship inside a larger box. The two boxes are formed in a single operation; the two are integrally joined and interlocked for practical rigidity. 4 figures. C.J.W.

SHAPIRO, DAVID H. Collapsible boxes. Canadian patent 488,443. Filed Nov. 10, 1950. Issued Nov. 25, 1952. 14 claims. Assigned to Standard Paper Box Limited.

Means are provided for releasably interlocking the side and end walls of a collapsible box so as to retain the walls in a setup condition, thus facilitating the setup of the box and its collapse to a flat condition for storage and/or shipping. 9 figures. C.J.W.

INORGANIC PAPER

BROWN, ALFRED W. Inorganic sheet material. U. S. patent 2,620,851. Filed July 9, 1949. Issued Dec. 9, 1952. 4 claims. Assigned to Owens-Corning Fiberglas Corporation. [Cl. 154-2.6]

An inorganic sheet material, especially useful as electrical insulating tape, is composed of a plurality of webs of interfelted asbestos fibers admixed with glass fibers and a reinforcing interwoven glass fabric disposed between the webs. The product is less than 0.010 inch thick and there are approximately 45,000 yards to a pound. 2 figures. C.J.W.

INSULATION AND INSULATING MATERIALS

HERITAGE, CLARK C. Manufacture of resin-bound fiber structure. Canadian patent 488,773. Filed Nov. 25, 1946. Issued Dec. 9, 1952. 3 claims. Assigned to Wood Conversion Company.

The preparation of a fiber blanket from cellulosic fibers and a phenol-formaldehyde resin is claimed. It is the same as U. S. patent 2,610,138 (Sept. 9, 1952); *cf.* B.I.P.C. 23: 142. 5 figures. C.J.W.

LIGNIN

KATZEN, RAPHAEL. Lignin and method of production. Canadian patent 488,529. Filed April 24, 1945. Issued Dec. 2, 1952. 7 claims. Assigned to Diamond Alkali Company.

Dry hydrolyzed lignocellulose, containing from 40 to 65% of lignin, is extracted in a Soxhlet apparatus with an organic solvent, the extract is concentrated, and the residue is poured into water to precipitate the lignin. The following percentage of the total lignin was obtained from a maple lignocellulose with 46.2% total lignin with the solvents named: Cellosolve 44.1, dioxane 41.1, methanol-benzene 38.5, acetone 33.9, methanol 35.1, diacetone alcohol 28.1; when tested by the 72% sulfuric acid method, these lignins were from 78.5 to 88.2% pure. Among the solvents which can be used are the lower aliphatic alcohols, ethylene glycol and its methyl, ethyl, and butyl ether, and methyl and ethyl acetate. The isolated lignin can be used for a variety of purposes, particularly as a binder for plastics. C.J.W.

KEILEN, JOHN J., JR., BALL, FRANK J., and GRESSANG, ROBERT

W. Method of coagulating colloidal lignates in aqueous dispersions. U. S. patent 2,623,040. Filed July 6, 1950. Issued Dec. 23, 1952. 6 claims. Assigned to West Virginia Pulp and Paper Company. [Cl. 260-124]

Black liquor is carbonated and passed through a tubular zone in which it is heated at a temperature of 170 to 220°F. and is maintained under a pressure in excess of the vapor pressure corresponding to the temperature of heating; it is also subjected to agitation corresponding to a Reynolds number in the range of 700 to 1500. The particle size of the resulting sodium lignate is dependent on the degree of agitation; the lower the Reynolds number, the greater the particle size. While the liquor is still agitated, it is cooled to prevent fusion of the lignate particles. Details are given of the liberation of the lignin from the sodium compound. 2 figures. C.J.W.

MACHINERY—BEATERS

STEPHANSEN, ERIK. Beating apparatus. Canadian patent 488,011. Filed Oct. 19, 1949. Issued Nov. 11, 1952. 5 claims. Assigned to Papirindustriens Forskningsinstitutt.

This is a division of Canadian patent 462,587 (Jan. 17, 1950; *cf.* B.I.P.C. 20: 448) and relates to a grinding apparatus for fibrous materials; one of the grinding elements is a cylinder or cone (the so-called roll) and the other is a casing which encloses the roll; both revolve about their axes, the grinding being effected between the roll and the inner wall of the casing. The apparatus is designed for laboratory use. 3 figures. C.J.W.

MACHINERY—CARTON-FEEDING MECHANISM

SHIELDS, ALBERT F. Folding machine. Canadian patent 488,030. Filed May 18, 1949. Issued Nov. 11, 1952. 1 claim. Assigned to S&S Corrugated Paper Machinery Co., Inc.

A feeding mechanism for carton-folding machines enables the folding and delivery of from 120 to 180 blanks per minute. This corresponds to U. S. patent 2,583,713 (Jan. 29, 1952); *cf.* B.I.P.C. 22: 545. 15 figures. C.J.W.

MACHINERY—CONSISTENCY REGULATORS

KARLSSON, KARL A. Mechanism responsive to variations in the consistency of a fibrous suspension. U. S. patent 2,618,966. Filed June 17, 1947. Issued Nov. 25, 1952. 6 claims. [Cl. 73-54]

This consistency regulator is covered by Canadian patent 453,233 (Dec. 14, 1948); *cf.* B.I.P.C. 19: 367-8. 4 figures. C.J.W.

MACHINERY—CONVERTING MACHINERY

BAGNALL, JOHN. Manufacture of paper coverings. Canadian patent 488,150. Filed March 19, 1949. Issued Nov. 18, 1952. 4 claims. Assigned to Canada Paper Company.

An apparatus is claimed for the manufacture of paper coverings for articles such as mattresses in which the paper is cut to length and formed into the desired tubular coverings; the principal part of the apparatus is the cutter, which is described. 5 figures. C.J.W.

LINDSAY, WALLACE. Hydraulically operated duplex box machine.

U. S. patent 2,620,711. Filed July 20, 1949. Issued Dec. 9, 1952. 29 claims. [Cl. 93-51]

The invention relates to an automatic box-forming machine which comprises two gluing and two forming means arranged to be actuated by a common power source. A hydraulic system for actuating the machine is described. Methods of handling the blanks are also a part of the invention. 23 figures. C.J.W.

ROHDIN, JAMES O. Carton erecting machine. U. S. patent 2,619,882. Filed Aug. 31, 1950. Issued Dec. 2, 1952. 2 claims. Assigned to Esselte forpackning ab. [Cl. 93-53]

The patent covers an apparatus for erecting cartons covered by the U. S. patent 2,427,858 (Sept. 27, 1947) to S. B. Hogdal; *cf.* B.I.P.C. 18: 214. 9 figures. C.J.W.

STEVENSON, ALLAN B., and CANNARD, WILLIAM H. Web reinforcing machine. U. S. patent 2,620,015. Filed April 13, 1948. Issued Dec. 2, 1952. 9 claims. Assigned to American Reenforced Paper Company. [Cl. 154-1.7]

This patent relates to a modification of the Gibbs' machine [U. S. patent 2,264,305 (Dec. 2, 1941)] for the application of sisal fibers or other desired reinforcement to a web of paper coated with alphalt or other adhesive. The patent specifically covers the construction of the carrier bars and the mechanism for actuating them. 17 figures. C.J.W.

WAHL, EUGENE A., and WINTERS, RALPH J. Carton flap opener. U. S. patent 2,620,961. Filed Dec. 21, 1951. Issued Dec. 9, 1952. 4 claims. Assigned to P. Ballantine & Sons. [Cl. 226-129]

A method is proposed for unfolding loose carton flaps from closed folded positions by fluid pressure. A single blower is provided to furnish both air suction and air blast conditions above the carton flaps to unfold and open the carton flaps as the cartons are advanced to a suitable inspection station. 2 figures. C.J.W.

WETHERELL, RUSSELL A. Machine for making cushioned pads. U. S. patent 2,620,854. Filed Sept. 30, 1948. Issued Dec. 9, 1952. 4 claims. Assigned to The Mason Box Company. [Cl. 154-41]

The machine is designed for the application of a flexible covering material of a decorative character to a relative stiff board having on one surface material to form a cushioned pad for use in jewelry boxes and the like. 12 figures. C.J.W.

MACHINERY—CURLATOR

COGHILL, JAMES T. Apparatus for treating wood pulp and the like. U. S. patent 2,622,490. Filed Sept. 9, 1947. Issued Dec. 23, 1952. 12 claims. Assigned to Curlator Corporation. [Cl. 92-26]

This patent covers a machine (Curlator) for treating pulp according to the method of Hill and Edwards as covered by U. S. patent 2,516,384 (July 25, 1950); *cf.* B.I.P.C. 20: 923. 17 figures. C.J.W.

MACHINERY—DRYERS

DECK, PHILIBERT. Drying machine for fabric and paper webs.

U. S. patent 2,621,422. Filed July 23, 1949. Issued Dec. 16, 1952. 2 claims. [Cl. 34-158]

The drying machine is provided with nozzles the lengthwise axes of which lie parallel to the web and may be swivelled on pivotal axes positioned perpendicularly to the latter. The nozzles are arranged in pairs symmetrically to the longitudinal axis of the drying machine and pivotable en bloc. 4 figures. C.J.W.

KELSEY, WALTER. Paper machine dryer and method of drying paper. Canadian patent 488,319. Filed March 31, 1950. Issued Nov. 25, 1952. 1 claim.

The drier consists of an outer revolving cylinder and an inner stationary cylinder; the air chamber between encloses a heating means. This corresponds to U. S. patent 2,586,829 (Feb. 26, 1952); *cf.* B.I.P.C. 22: 633. 13 figures. C.J.W.

MACHINERY—FOLDING MACHINE

SHIELDS, ALBERT F. Automatic folder. Canadian patent 488,029. Filed April 24, 1947. Issued Nov. 11, 1952. 11 claims. Assigned to S&S Corrugated Paper Machinery Co., Inc.

This is an improved form of the folder claimed in Canadian patent 419,465 (April 4, 1944). The improvements consist in means of increasing the folding rate and of the sheet sizes that can be handled. 12 figures. C.J.W.

MACHINERY—PACKAGING MACHINERY

ROSE, ALFRED G., and GILBERT, JOSEPH A. Package. U. S. patent 2,620,964. Filed Oct. 30, 1947. Issued Dec. 9, 1952. 2 claims. Assigned to Rose Brothers (Gainsborough) Limited. [Cl. 229-87]

A method is described for the wrapping of a bar of soap or a package of cigarettes in a paper or foil wrapper. It corresponds to Canadian patent 472,995 (April 17, 1951); *cf.* B.I.P.C. 21: 751. 13 figures. C.J.W.

MACHINERY—PASTING MACHINE

CHARLES, GEORGE K. Apparatus for applying adhesive strip to cylindrical cans or other containers. Canadian patent 487,881. Filed Nov. 17, 1947. Issued Nov. 11, 1952. 3 claims.

A rotary pressure drum is used to apply a gummed or ungummed label to cylindrical containers. 5 figures. C.J.W.

GAUBERT, RENE J. Label applying machine. U. S. patent 2,619,247. Filed March 10, 1948. Issued Nov. 25, 1952. 2 claims. Assigned to Simplex Packaging Machinery, Inc. [Cl. 216-29]

A method and machine are described for the application of labels to bags of Pliofilm or waterproof cellophane. 10 figures. C.J.W.

PERRY, LLOYD M. Method of labeling containers. U. S. patent 2,621,823. Filed April 19, 1951. Issued Dec. 16, 1952. 2 claims. Assigned to Nashua Corporation. [Cl. 216-62]

A machine is provided for the application of labels to cans, bottles, or the like by means of heat-activated adhesives. 2 figures. C.J.W.

MACHINERY—SHREDDERS

LEE, FILEMON T. Paper shredding machine. U. S. patent 2,621,567. Filed May 23, 1949. Issued Dec. 16, 1952. 6 claims. [Cl. 93-1]

The machine is designed for cutting paper (e.g., newspapers) into strips to be used as a filler in packaging merchandise. While being cut, the strips are kinked at various points along their length to produce zig-zag strips. Such strips are restrained somewhat from free flexing and thus less material is required in the packing operation. 12 figures. C.J.W.

MACHINERY—SLITTERS AND WINDERS

LANGBO, GEORG. Winding machine for paper rolls. U. S. patent 2,620,141. Filed April 1, 1947. Issued Dec. 2, 1952. 5 claims. [Cl. 242-56]

The winder is provided with two or more spindles for the consecutive winding of paper rolls and with means associated with each spindle for the automatic cutting of the paper web, the gluing of the cut portion of the web to the finished roll, and the expulsion of the roll. Each spindle may be driven individually, the speed being so adjusted that the velocity of the paper web remains approximately constant. 2 figures. C.J.W.

SCRUGGS, THOMAS M., and HALL, EARL K. Slitting and winding apparatus. U. S. patent 2,621,736. Filed Oct. 21, 1948. Issued Dec. 16, 1952. 29 claims. Assigned to Bemis Bro. Bag Company. [Cl. 164-65]

The apparatus is designed to slit a web of paper into narrow strips and to wind the strips into rolls. Various advantages of the new apparatus are enumerated. 34 figures. C.J.W.

MACHINERY—SULFUR BURNERS

ALLEN, LOUIS N., JR. Process for producing sulfur dioxide and sulfur burner. U. S. patent 2,622,007. Filed March 16, 1949. Issued Dec. 16, 1952. 3 claims. Assigned to Chemical Construction Corporation. [Cl. 23-179]

The patent covers a sulfur burner which is economical when three tons or less of sulfur are burned per 24 hours. 1 figure. C.J.W.

MACHINERY—WEB TRANSFER

GOODWILLIE, JOHN E. Selective web transfer control for paper machinery. U. S. patent 2,622,492. Filed July 26, 1947. 6 claims. Assigned to Beloit Iron Works. [Cl. 92-49]

In a suction transfer assemble for a papermaking machine, a roll of the ordinary suction type is selectively provided with air at sub- or super-atmospheric pressure; the latter prevents transfer of the sheet to the pickup felt carried by the roll, whereas the former assists in the transfer of the sheet. A fluid pressure supply apparatus is provided for the transfer roll in which a reversible water-sealed type of pump is employed and is selectively energized in opposite directions to supply either type of air pressure. 3 figures. C.J.W.

PACKAGING

ARTHUR, CHARLES J. Packaging system. U. S. patent 2,619,227. Filed Jan. 23, 1950. Issued Nov. 25, 1952. 13 claims. [Cl. 206-56]

A container of corrugated or other board is designed for the packaging of electric light bulbs; a flat blank with spaced holes is positioned on top of the necks of the bulbs and then folded around the bulbs into a cylinder. 6 figures. C.J.W.

HITCHCOCK, GUY C. Pocket tissue package. U. S. patent 2,621,788. Filed Oct. 21, 1948. Issued Dec. 16, 1952. 1 claim. [Cl. 206-57]

A container for tissue sheets has a readily removable window section which affords ready access to the exposed folds of the tissue sheets and permits their ready withdrawal. 14 figures. C.J.W.

POWELL, GERRY. Package or container. U. S. patent 2,620,962. Filed May 31, 1951. Issued Dec. 9, 1952. 6 claims. Assigned to Bernard B. Workman. [Cl. 229-34]

A container is proposed for the packaging of candy canes or sticks and similar fragile or brittle articles. The ends of the articles are supported by two opposed, inclined cradle panels, spaced from the walls of the package which parallel such cradle-panels. 4 figures. C.J.W.

SCOVILLE, DAVID M. Paper package. Canadian patent 488,496. Filed May 22, 1952. Issued Dec. 2, 1952. 8 claims.

The patent relates to a stack of interleaved carbon paper and second sheets so formed and shaped that alignment is always maintained. 4 figures. C.J.W.

PACKAGING—OPENERS

ROCERETA, WILLIAM J. Opening tool for paper cartons. U. S. patent 2,621,549. Filed July 19, 1948. Issued Dec. 16, 1952. 1 claim. [Cl. 81-3]

The apparatus is designed for lifting the sealing flap of liquid-containing cartons, such as milk bottles. 2 figures. C.J.W.

PAPER—COATED

LANDES, CHESTER G. Coating compositions. Canadian patent 488,676. Filed Sept. 13, 1944. Issued Dec. 9, 1952. 10 claims. Assigned to American Cyanamid Company.

This invention relates to the use of a wax emulsion or an urea-formaldehyde resin with a coating color composed of clay and casein or starch. This is the same as U. S. patent 2,399,489 (April 30, 1946). C.J.W.

RITSON, DANIEL D. Soya protein paper coating containing methylated melamine formaldehyde resin. U. S. patent 2,620,316. Filed Aug. 20, 1949. Issued Dec. 2, 1952. 4 claims. Assigned to American Cyanamid Company. [Cl. 260-6]

A liquid coating composition with a pH of from 7 to 10 contains soybean

protein and about 4% by weight (on the basis of the protein) of a water-soluble methylated melamine-formaldehyde resin which will heat cure at a moderately low temperature to a water-insoluble condition. One example of such a formulation is as follows: 201 parts china clay, 1 part 10% aqueous sodium tetraphosphate, 33 parts soybean protein product (88.7% soybean protein), 3.9 parts sodium carbonate, 0.9 part borax, 0.6 part of the spray-dried methylated melamine-formaldehyde resin, and 282 parts of water. The preparation of the coating mixture is described. Properties of papers coated with such mixtures are given. The initial wet-rub resistance of the coated paper is improved. C.J.W.

PAPER SIZING

MOLLER, FREDRIK A., and LOLKEMA, JAN. Process of manufacturing dry starch products, soluble in cold water. Canadian patent 488,418. Filed April 25, 1946. Issued Nov. 25, 1952. 5 claims. Assigned to Naamlooze Vennootschap: W. A. Scholten's Chemische Fabrieken.

Cold swelling starch is treated with a compound which will yield an ether or ester, such as sodium chloroacetate, sodium bromoethanesulfonate, diethyl sulfate, dichlorodimethyl sulfate, and the like. The products are suitable as sizing agents for paper and for thickening agents for printing on paper. C.J.W.

PAPER SPECIALTIES

ANDERSEN, EMIL. Bag closure with label. U. S. patent 2,620,120. Filed June 23, 1949. Issued Dec. 2, 1952. 1 claim. Assigned to Century Engineering Co. [Cl. 229-62]

Bags of cellophane, Pliofilm, or other transparent material have a pre-attached label at the sealed end of the bag as it leaves the factory; after filling, the other end of the bag is sealed and the bag is inverted to display the label. 5 figures. C.J.W.

ANDERSON, EMIL. Extendible and collapsible filter bag. U. S. patent 2,621,757. Filed Nov. 28, 1947. Issued Dec. 16, 1952. 1 claim. Assigned to Electrolux Corporation. [Cl. 183-51]

The construction of an extendible and collapsible duct bag for a suction cleaner is described. The flexible portion of the container is preferably made of an initially flat sheet of paper, folded to provide two pairs of side walls and having opposite longitudinal edges joined by a glued seam. 17 figures. C.J.W.

HERSEY, RICHARD M. Labeled bag. Canadian patent 488,511. Filed Aug. 28, 1947. Issued Dec. 2, 1952. 7 claims. Assigned to Bemis Bro. Bag Company.

A method is described for the attachment to a fabric bag of a printed label which forms a continuous band around the bag from top to bottom. 11 figures. C.J.W.

HOEPPNER, ARTHUR D., and HAYES, RICHARD D. Bag construction. U. S. patent 2,620,842. Filed Sept. 21, 1950. Issued Dec. 9, 1952. 1 claim. Assigned to Bemis Bro. Bag Co. [Cl. 150-7]

A bag is formed from flat overlying plies forming front and rear wall elements, in which the upper portion of the rear wall element is folded over the front wall element, this providing a combination closure and handle for the bag. 3 figures. C.J.W.

MACDONALD, CHESTER R. Process of making multiply waterproofed sheets. U. S. patent 2,622,491. Filed Oct. 4, 1948. Issued Dec. 23, 1952. 1 claim. Assigned to The Patent and Licensing Corporation. [Cl. 92-40]

An aqueous emulsion of asphalt containing a mineral colloid (e.g., clay as the emulsifying agent) is treated with an acidic salt (e.g., alum, sodium acid phosphate, and the like) or an acid (e.g., sulfuric acid) to adjust the pH within the range of 3.5 to 5 and the modified emulsion is used in the preparation of multi-ply sheets; the water in the emulsion drains freely, permitting the operation of the machine at high rates of speed. The modification does not affect the adhesive properties of the emulsion. 2 figures. C.J.W.

SCHUR, MILTON O., and LEVY, ROBERT M. Cigarette paper and process. Canadian patent 488,379. Filed Sept. 1, 1950. Issued Nov. 25, 1952. 12 claims. Assigned to Ecusta Paper Corporation.

A quaternary ammonium phosphate, such as tetra(2-hydroxyethyl)ammonium phosphate, is added to cigarette paper. This corresponds to U. S. patent 2,580,609 (Jan. 1, 1952); *cf.* B.I.P.C. *22*: 467. C.J.W.

SHUMANN, HAROLD F. Multiply window bag. U. S. patent 2,619,277. Filed Dec. 13, 1948. Issued Nov. 25, 1952. 1 claim. [Cl. 229-55]

A bag, which may be formed of cellophane, is either opaque or translucent throughout most of its circumference but has a transparent window throughout most of its length. All the longitudinal seams are heat sealed. 2 figures. C.J.W.

PURIFIED WOOD FIBER

KEYSER, LOUIS S., and BROWN, ROBERT E. Pulp purification. U. S. patent 2,621,124. Filed May 29, 1946. Issued Dec. 9, 1952. 7 claims. Assigned to Rayonier Incorporated. [Cl. 92-13]

In the preparation of highly purified cellulose from wood pulp, untreated pulp is treated with the liquor from a previous extraction. Such procedure removes much of the water from the fresh pulp and, at the same time, the alkali in the waste liquor is largely absorbed by the fresh pulp. This practice reduces greatly the quantity of sodium hydroxide required in the purification process. 4 figures. C.J.W.

ROOFING FELTS

POLE, GORDON R. Low temperature coatings for roofing granules and asbestos-cement shingles. Canadian patent 488,234. Filed Jan. 11, 1951. Issued Nov. 18, 1952. 13 claims. Assigned to Minnesota Mining & Manufacturing Company.

A strongly bonded, weather-resistant coating for asphalt shingles and the like is prepared by coating granules (graystone, syenite, quartz, and similar

materials) with sodium silicate and ammonium or sodium fluoroborate at 90 to 130°F. and then heating in a rotary kiln at 375 to 500° (preferably at 450°). C.J.W.

SETUP BOXES

GIBBONS, CLYDE F. Container. U. S. patent 2,619,276. Filed March 6, 1950. Issued Nov. 25, 1952. 2 claims. Assigned to Gaylord Container Corporation. [Cl. 229-33]

The container comprises a body section with bottom and side walls and a cover member of similar construction hinged to one of the walls of the body section, at least one wall of the cover member being provided with a locking tab (preferably T-shaped) which is adapted to be inserted in a recess of similar shape in the corresponding walls of the body section. 2 figures. C.J.W.

SHIPPING CONTAINERS

FRANKENSTEIN, WILLIAM P. Convertible carton. U. S. patent 2,618,887. Filed July 15, 1947. Issued Nov. 25, 1952. 13 claims. [Cl. 46-11]

This patent is an improvement on U. S. patent 2,397,934 (April 9, 1946). It relates to a container which can be used for shipping and display and then be formed into a toy building. 25 figures. C.J.W.

GEORGE, WALTER C. Shipping container. U. S. patent 2,620,119. Filed July 23, 1951. Issued Dec. 2, 1952. 6 claims. Assigned to Gaylord Container Corporation. [Cl. 229-45]

A polygonal container is described which is suitable for the shipment of nails and other articles of hardware. 23 figures. C.J.W.

STEFANICH, ANTHONY J. Ventilated container. U. S. patent 2,621,847. Filed April 26, 1948. Issued Dec. 16, 1952. 5 claims. [Cl. 229-6]

The construction of a lug-type of container is claimed; it is suitable for the shipment of fresh fruits and vegetables. It may be a combination of wood and fiberboard and is stated to have improved strength and ventilation characteristics. It has resilient sides and bottom, thus providing for a cushioned support for produce packed therein. 14 figures. C.J.W.

SHIPPING CONTAINERS—BARRELS

HAGOPIAN, VAHAN. Container. U. S. patent 2,620,963. Filed Dec. 16, 1948. Issued Dec. 9, 1952. 13 claims. Assigned to The Plastic Barrel Corporation. [Cl. 229-67]

The container is formed of two cup-shaped plies of felted material, such as paper stock or other vegetable and animal fibers, impregnated with a thermosetting adhesive, prepared by a conventional process of wet felting on a screen or other form, the free edges of one set being interleaved with the free edges of the other set; it is usually in the shape of a barrel. There is an interior bag of elastic material. The bag and the enclosure have a registered filling and discharging opening and a closure means of the opening. 2 figures. C.J.W.

SHIPPING CONTAINERS—MULTIWALL BAGS

CRAIG, MERLE E. Sift-proof bag bottom. Canadian patent 488,182. Filed April 21, 1952. Issued Nov. 18, 1952. 1 claim. Assigned to Crown Zellerbach Corporation.

A bag for the handling of carbon black is claimed. This corresponds to U. S. patent 2,600,487 (June 17, 1952); *cf.* B.I.P.C. 22: 881. 5 figures.
C.J.W.

JOHNSSON, JOHN. Device for closing and sealing of valves in valve bags. U. S. patent 2,620,121. Filed Feb. 2, 1948. Issued Dec. 2, 1952. 4 claims. Assigned to Billeruds Aktiebolag. [Cl. 229-62.5]

This corresponds to Canadian patent 461,858 (Dec. 20, 1949); cf. B.I.P.C. 20:375-6. 9 figures. C.J.W.

SHIPPING CONTAINERS—TESTING

WAGENHALS, ROBERT E. Tube testing machine. U. S. patent 2,618,963. Filed April 4, 1949. Issued Nov. 25, 1952. 2 claims. Assigned to The Timken Roller Bearing Company. [Cl. 73-37]

The device is intended to test the strength of the tube, the cap strength, and the strength of the joint between the cap and the tube; it is also intended to test the impact load capacity of the capped end of the tube by directing a blast of air against the end. The device comprises a supporting frame, a nozzle adapted to be positioned in a tube having one open end and one capped end, means for controlling the flow of air through the nozzle, and means for holding the tube against lengthwise movement. 4 figures.
C.J.W.

STARCH

KERR, RALPH W. Process for modifying starch with aluminum chloride and enzyme and applications of such modified starch. U. S. patent 2,619,428. Filed March 1, 1950. Issued Nov. 25, 1952. 40 claims. Assigned to Corn Products Refining Company. [Cl. 106-214]

Starch is modified by treating with 0.05 to 0.5% of aluminum chloride at a temperature of 20 to 105°C. and a pH of 2.8 to 3.4 and then by treating with a suitable enzyme at a pH value of 5.5 to 7.5 and the appropriate temperature for the enzyme used. Pastes made from such modified starches have much less tendency to increase in viscosity on aging than do pastes from acid-modified starches; they also have superior protective colloidal properties. They are suitable as adhesives, sizing materials, and the like. Examples are given of their use in coating colors. C.J.W.

VAN DER MEER, WILLEM A., and LOLKEMA, JAN. Process of manufacturing starch solutions which when dried will produce water resistant layers and of cold swelling starches suitable for this purpose. Canadian patent 488,419. Filed Nov. 14, 1946. Issued Nov. 25, 1952. 4 claims. Assigned to Naamlooze Vennootschap: W. A. Scholten's Chemische Fabrieken.

In an example, 1000 parts of potato starch are suspended in 1000 parts of water and 500 parts of 40% formaldehyde, the mixture is adjusted to pH 6 by addition of dilute sodium hydroxide, and subsequently converted into

cold swelling starch on a heated rotating cylinder at about 120 to 130°C. The resulting product will dissolve completely in 8 to 10 parts of cold water. In place of the formaldehyde, hexamethylenetetramine, paraformaldehyde, or trihydroxymethylene can be used. The pH value may vary from 5 to 7. C.J.W.

SULFITE WASTE LIQUOR—MAGNESIUM BASE

WILCOXSON, LESLIE S. Apparatus for the recovery of chemicals and heat from residual liquor. U. S. patent 2,619,411. Filed Sept. 29, 1948. Issued Nov. 25, 1952. 6 claims. Assigned to The Babcock & Wilcox Company. [Cl. 23-262]

A combustion furnace is described for the recovery of chemicals and heat from spent magnesium-base sulfite liquor. Provision is made for the continuous suspension burning of the waste liquor under controlled conditions of temperature and atmosphere for the recovery of chemicals in a dry state and for the absorption of heat in an associated vapor generator. 5 figures. C.J.W.

SULFUR

UDY, MARVIN J. Sulfur recovery. U. S. patent 2,619,407. Filed Dec. 9, 1946. Issued Nov. 25, 1952. 14 claims. Assigned to Guaranty Investment Corporation, Limited. [Cl. 23-224]

Iron pyrites (which may contain one or more additional metals) is heated to drive off about one third of the sulfur as sulfur dioxide; the remaining product is treated with an acid to liberate the balance of the sulfur as hydrogen sulfide. The two gases are then treated with sodium sulfite to obtain elemental sulfur. 1 figure. C.J.W.

TALL OIL

FREEMAN, STEPHEN E. Fractionation of free fatty acids. Canadian patent 488,250. Filed Nov. 3, 1947. Issued Nov. 18, 1952. 11 claims. Assigned to Pittsburgh Plate Glass Company.

Tall oil and other vegetable oils are treated with a polar solvent such as furfural and a nonpolar solvent such as iso-octane. This corresponds to U. S. patent 2,278,309 (March 31, 1941). 1 figure. C.J.W.

KOONCE, SAMUEL, and PERRY, EDMOND. Method of separating fatty acids from rosin acids of tall oil. Canadian patent 488,190. Filed Feb. 1, 1947. Issued Nov. 18, 1952. 7 claims. Assigned to Eastman Kodak Company.

The resin acids of the tall oil are reacted with maleic anhydride and thus separated from the fatty acids. This corresponds to U. S. patent 2,538,103 (Jan. 16, 1951); *cf.* B.I.P.C. 21: 444-5. C.J.W.

KOONCE, SAMUEL, and PERRY, EDMOND. Treatment of tall oil and portions thereof. Canadian patent 488,189. Filed Feb. 1, 1947. Issued Nov. 18, 1952. 3 claims. Assigned to Eastman Kodak Company.

Tall oil is partially esterified and the esters of the fatty acids and the free rosin acids are separated by the use of adsorbents. This corresponds to U. S. patent 2,485,744 (Oct. 25, 1949); *cf.* B.I.P.C. 20: 225. C.J.W.

ULTRA-VIOLET RAYS

PEARL, IRWIN A. Ultraviolet-radiation impervious wrapping material. Canadian patent 488,446. Filed June 26, 1948. Issued Nov. 25, 1952. 12 claims. Assigned to Sulphite Products Corporation.

The material is coated with a composition containing an ester of 3-methoxy-4-hydroxy-benzoic acid. This corresponds to U. S. patent 2,580,461 (Jan. 1, 1952); *cf.* B.I.P.C. 22: 473. 1 figure. C.J.W.

WET STRENGTH

DUDLEY, JAMES R., and ANTHES, JOHN A. Modified urea formaldehyde resins and methods of preparing the same. Canadian patent 488,679. Filed May 15, 1947. Issued Dec. 9, 1952. 17 claims. Assigned to American Cyanamid Company.

The reaction product of dicyandiamide and an amine-formaldehyde resin is used for wet-strength paper. This corresponds to U. S. patent 2,497,073 (Feb. 14, 1950); *cf.* B.I.P.C. 20: 769. C.J.W.

KEIM, GERALD I. Modified synthetic resin and paper containing the same. U. S. patent 2,622,979. Filed Aug. 14, 1947. Issued Dec. 23, 1952. 10 claims. Assigned to Hercules Powder Company. [Cl. 92-3]

A urea-formaldehyde resin, prepared from one mole of urea and about two moles of formaldehyde, is treated with from 5 to 20 parts (per 100 parts of resin) of sodium lignosulfonate, the pH is adjusted to about 5.5 with formic acid, and the mixture is refluxed until it has the desired viscosity, after which it is diluted with alcohol; the product is dark brown and is soluble in water at moderate concentrations. When used in connection with rosin size, it gives a high wet-strength paper. C.J.W.

Book Reviews

VOET, ANDRIES. Ink and paper in the printing process. New York, Interscience Publishers, 1952. 213 p.

In the preface, the author states: "This book is intended as an introduction to the physics and chemistry of ink and its interaction with paper in the major printing processes. It is written for the more experienced graphic-arts student with basic understanding of science." In the opinion of the reviewer, the author has achieved his purpose in an adequate fashion. He has collected a great deal of interesting material in the text. The subject matter is divided into two parts: Part I—Ink and press, and Part II—Ink and paper. Part I treats such subjects as rheology, flow of dispersions, flow of ink on the press, and separation (or splitting) of ink films. Part II includes such subjects as halftone reproduction, microscopy of halftone printing, ink coverage, penetration of ink into paper, show-through and strike-through, ink transfer, picking, offset, and ink drying. The book should be useful and stimulating to all technical men, and many others interested in printing papers. The author's experience with inks is reflected in the book, and readers primarily interested in paper may wish that greater emphasis had been given to this subject. Some readers will not agree with all of the author's conclusions, but that situation is indicative of our present knowledge of the interaction of ink and paper.

G. R. SEARS

WISE, LOUIS E., and JAHN, EDWIN C., ed. Wood chemistry. 2d ed. New York, Reinhold, 1952. 2 v. 1343 p.

The literature on wood chemistry has become so voluminous since the first edition of this monograph was published in 1944 that, in order to cover the field adequately, this present edition necessitated two volumes. To appraise the merits of the present treatise, the reviewer felt that a comparison between the old and the new would be in order, since the reviewer assumes that those concerned with this field are familiar with the popular first edition. Volume I consists of three parts, subdivided into 17 chapters. Chapter I. Introduction by L. E. Wise and E. C. Jahn, 4 p. *Part I.* The growth, anatomy and physical properties of wood, 89 p. Chapter 2. Origin and anatomy of wood by the late Harry P. Brown, 65 p. and Chapter 3. The mechanical and physical properties of wood by Carl C. Forsaith, 25 p. In these two chapters, the authors have duplicated, in the main, the material as presented in the first edition. Brown does add a short discussion on ultramicroscopic studies of mature woody cells. *Part II.* Components and chemistry of the cell wall, 441 p. Chapter 4. The chemistry of the cell walls of wood by W. M. Harlow, 18 p. This chapter has been lifted from the first edition, except for a brief reference on electron-microscopic studies of the cell wall. Chapter 5. Cellulose: Chemical evidence regarding its constitution by L. E. Wise, 15 p. Although this follows the same pattern as previously presented, Wise has brought the material up to date, together with a discussion showing the inadequacy of a simple uniform chain structure for the cellulose molecule. Chapter 6. Cellulose: Physical evidence regarding its constitution by H. Mark, 30 p. Although this chapter was largely transplanted from the first edition, added material appears on the degree of crystallinity of samples of cellulose, infrared absorption spectra, and the electron microscope. Chapter 7. Chemically modified cellulose by C. B. Purves, 64 p. This is by a new contributor, and the material has been greatly expanded. It is very well presented and includes analytical methods for characterizing modified celluloses. Chapter 8. Cellulose solvents and the properties of cellulose in solution

by A. J. Stamm, 52 p. Although the author follows the same outline as previously presented, he has brought the various subjects up to date and includes new material on end-group studies; the use of the osmotic balance in which solution displacements are weighed rather than measured, ultracentrifuge measurements, diffusion studies, degree of polymerization of cellulose, and light scatterings are a few examples. He also has an addendum to include later work in this field. Chapter 9. Cellulose compounds and derivatives by E. C. Jahn, 91 p. This author has completely rewritten this chapter and greatly expanded his former presentation. It is well written. Chapter 10. The hemicelluloses by L. E. Wise, 40 p. The authorship here has been changed and the new presentation is refreshing and well planned, including a brief discussion of analytical methods—i.e., fermentation and chromatography. Chapter 11. The chemistry of lignin by F. E. Brauns, 131 p. This chapter is likewise under new authorship. Although Dr. Brauns has recently written a comprehensive treatise on lignin (1951), he has ably condensed the information into an excellent review. He also has an addendum, including pertinent references by lignin investigators into 1951. *Part III.* The extraneous substances, 145 p. This portion of the book has been completely rewritten and greatly expanded. Instead of one contributor, the present one has five. Chapter 12. Extraneous materials of wood; introduction by L. E. Wise, 5 p. As pointed out here, extractives in wood are assuming a greater importance in the field of wood chemistry and, hence, required a larger treatment. Chapter 13. The volatile oils by E. F. Kurth, 42 p. The tables listing volatile oils from oleoresin and wood have been enlarged upon and the author brings out the possibility of classification of pines based on chemical constituents. Apparently, the author did not have the opportunity to include some later studies, for instance, by Mirov (1949-51) on volatile oils from pine oleoresins, which would question a number of pine oil compositions as reported by earlier investigators. Nothing is reported on the use of acids in stimulating oleoresin production, although this matter is taken up in the subsequent chapter. Chapter 14. Wood resins by G. C. Harris, 28 p. This author is well known for his investigations on the structures of resin acids and he gives an excellent review clarifying this formerly confusing picture. Included is a good resume of the methods used in the author's laboratory in separating and identifying resin acid mixtures, as well as a discussion of industrial processes. Chapter 15. The tannins and coloring matters by M. A. Buchanan, 20 p. Although this chapter is relatively short, a great deal of pertinent information is included. It has an addendum, including later references from 1950-51. Chapter 16. Miscellaneous extraneous components of wood by L. E. Wise, 23 p. The author gives good brief reviews on the chemistry of phenols, carbohydrates, glycosides, organic acids and their salts, organic nitrogen compounds, cyclitols, and mineral constituents. Chapter 17. Phenolic and other extraneous components of coniferous heartwoods; their relation to taxonomy by H. Erdtman 28 p. This is an excellent summary of the significant contributions made by Erdtman and his co-workers, together with others, in the field of extractive components. Of considerable interest is the relationship between specific constituents and various genera. This approach may prove to be an important new tool for taxonomists.

Volume II. consists of four parts (IV-VII), subdivided into 17 chapters. *Part IV.* Surface properties of cellulose material, 124 p. Chapter 18. Surface properties of cellulosic materials by A. J. Stamm, 124 p. This chapter is comparable to that appearing in the first edition, but the author has apparently made a diligent study of recent developments which he has incorporated. There is also an addendum, including references to 1952. *Part V.* Industrial wood chemistry, 240 p. Chapter 19. Combustion of wood by L. F. Hawley, 9 p. The author has, in the main, rewritten this short chapter as originally presented. Chapter 20. The thermal decomposition of wood by A. W. Goos, 26 p. This chapter is under new authorship and is completely rewritten and

expanded. Chapter 21. Wood hydrolysis by E. E. Harris, 79 p. Whereas only 14 pages were devoted to this subject in the former edition under "Chemical behavior of wood," it is now introduced as subject matter for a complete chapter. This is evidence of how extensive this phase of wood chemistry has become since the first edition. The author gives a good resume. Chapter 22. The chemical behavior of wood by E. C. Jahn, 44 p. The author has rearranged the subject as previously reported and has added considerably on the new developments relative to modified wood. However, the reviewer does not entirely agree with the following statement, p. 960-1: "Despite numerous investigations to develop a satisfactory process for converting wood wastes into plastics or structural board, the problem remains largely unsolved." Industry is replete with processes involving: (1) the production of hardboard from wood fiber obtained from wood waste and, to a lesser extent, from shavings and sawdust, and (2) the use of glues in producing boards from random pieces of mill waste. In the first edition, delignification of wood was treated as a single chapter. In the present edition, this subject is divided into four chapters, each by a different contributor. Chapter 23. Alkaline delignification of wood by W. F. Holzer, 24 p. Chapter 24. Sulfite delignification of wood by H. Erdtman, 22 p. Chapter 25. The lesser delignification processes by E. C. Jahn, 10 p. and Chapter 26. Bleaching of wood pulp by F. H. Yorston, 26 p. Each of these authors is well qualified and has ably summarized his respective subject. *Part VI.* Decomposition of wood by microorganisms, 56 p. Chapter 27. The biological decomposition of wood by the late W. G. Campbell, 56 p. This is by a new author and is very readable. *Part VII.* The chemical analysis of wood, 159 p. This is divided into seven chapters, each of which is under the new authorship of B. L. Browning. These include Chapter 28. Introduction and miscellaneous determinations, 19 p. Chapter 29. The polysaccharide fraction of wood: The isolation of cellulose preparations and the determination of cellulose, 21 p. Chapter 30. The analysis of noncellulose polysaccharides, 33 p. Chapter 31. The determination of functional groups, 22 p. Chapter 32. The determination of lignin, 24 p. Chapter 33. The evaluation of cellulose preparations, 21 p. and Chapter 34 (with I. H. Isenberg). Analytical data and their significance, 19 p. These chapters are good surveys of methods used and give procedures for the most accepted methods as employed by the Forest Products Laboratory and The Institute of Paper Chemistry. The subject index was compiled by C. J. West, 65 p., covering both volumes.

The facets of wood chemistry are becoming so diversified and extensive that periodically new editions will be required as is demonstrated here. Rather than duplicating the original subject matter plus the addition of up-to-date material when each edition is to be published, it is suggested that subsequent editions come out in the form of Progresses or Advances. In that manner, an individual would not have to repurchase the information he already has available in order to keep abreast of the newer developments. The present edition perhaps would have been more useful as a text for students in wood chemistry if "The chemical analysis of wood" portion had been included in Vol. I. with perhaps some deletions in the cellulose presentation. This would enable the student to purchase but one volume and still have the subject adequately covered. The instructor would be quite reluctant to tell his students that they would be required to purchase two volumes for the course. In summary, these volumes represent a scholarly review of the present state of knowledge of wood chemistry by contributors who are thoroughly acquainted with the specific fields. Throughout, references are numerous and, in most instances, the literature appears to be covered into 1950. The printing and binding are of good quality. Although the price may limit the distribution somewhat, the book should certainly be in all chemical libraries, in the hands of all chemists, and available to all technologists working with wood.

ARTHUR B. ANDERSON

The Institute of Paper Chemistry has entered into an agreement with University Microfilms, Ann Arbor, Michigan, whereby University Microfilms is authorized to provide microfilm copies of this Bulletin to subscribers. To the extent that back issues were in print at the date of execution of the agreement, microfilm copies of these back issues can also be obtained. Sales by University Microfilms of films of this Bulletin are restricted to regular subscribers to the Bulletin. The microfilm is distributed only at the end of the volume year. The film is in the form of positive microfilm, and is furnished on metal reels, suitably labeled. Inquiries concerning purchase should be directed to:

University Microfilms
313 North First Street
Ann Arbor, Michigan

LIBRARY SERVICE

The Library of The Institute of Paper Chemistry is located in the Kimberly Memorial Building. Its purpose is to serve the students and the faculty of The Institute of Paper Chemistry and the chemists and technologists of the pulp and paper industry.

To contributing members it gives the following service:

A monthly bulletin is issued, listing all new books and periodicals added to the library and containing titles and abstracts of articles published during the previous month in the field of pulp and paper chemistry and technology. The annual index carries a list of periodicals currently received.

At a reasonable cost the librarian will furnish complete reference lists on chemical and technical problems for member mills, and will procure translations, photostats, or abstracts of the articles listed. Upon request, member mills working on special problems will be kept in touch with new publications related to their work.

Reviews of new publications pertaining to the field of pulp and papermaking will be included from time to time.

The library is open daily with the exception of Sundays from 8:15-5:00 and from 7:30-9:30. Saturday it closes at 5:00 o'clock.